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JOURNAL OF THE
AMERICAN DIETETIC ASSOCIATION

VOLUME 15 February, 1939 NUMBER 2

NUTRITION AND THE HEALTH OF THE SCHOOL CHILD[1]

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"THE brain", said Francis Bacon, "is in some sort of custody of the stomach and relief of malnutrition gives relief of mental dulness." Nevertheless, in the time of Bacon there was little practical attention paid to this wise remark; "the demands of hunger were too often ascribed to the sin of greed." The Brontë children lived in Haworth, which according to Sir Arthur Newsholme was a hotbed of tuberculosis, of which they all died—Charlotte, Emily and Charles —in their brilliant youth. These unfortunate children were sent to the Cowan's Bridge School, where they were "expected to regard higher things than dainty pampering of appetite". In those times physical training of school children did not achieve much success because the children were too weak; but always where food was provided, physical training did good. When English boys of that period went into the army, they gained as much as 5 to 7 pounds in weight and an inch in chest girth in less than two months, because they were for the first time in their lives provided with anything approaching adequate food.

An interesting history of progress in the feeding of school boys from the sixteenth century until the present time is furnished by Dr. Friend (1), the present chief medical officer of Christ's Hospital, who has written its nutritional history. This is the school of whose diet Charles Lamb (2) painted such a pathetic picture in his *Essays of Elia*. Lamb attended this school from 1782 to 1789 and in the essays portrays his own experience there as a little boy. There was no happy memory of the breakfast: "a quarter of a penny loaf moistened with attenuated small beer, in wooden piggins, smacking of the pitched earthen jack it was poured from"; and still less of dinner: "milk porritch, blue and tasteless" or "pease soup, coarse and choking", alternating with meats in "rather more savory but grudging portions—which excited our appetites and disappointed our stomachs, in almost equal proportion".

In 1704 the boys received per day about 1170 calories in food and 730 in beer. The food consisted mostly of bread, a little cheese and a few shreds of meat; there being a conspicuous lack of milk, fruit or vegetables. And the

[1] Read before the General Session, American Dietetic Association, Milwaukee, October 11, 1938.

Governors objected to any buying of food by the children, contending that "this tends not only to prejudice of the children's health but also is a disreputation and scandall to the house, it looking as if the children wanted victualls". calories were not increased beyond an average of about 2000 per day. It was only after the World War that Christ's Hospital instituted notable improvement in the total energy value of its four-hundred-year-old dietary. Calories from

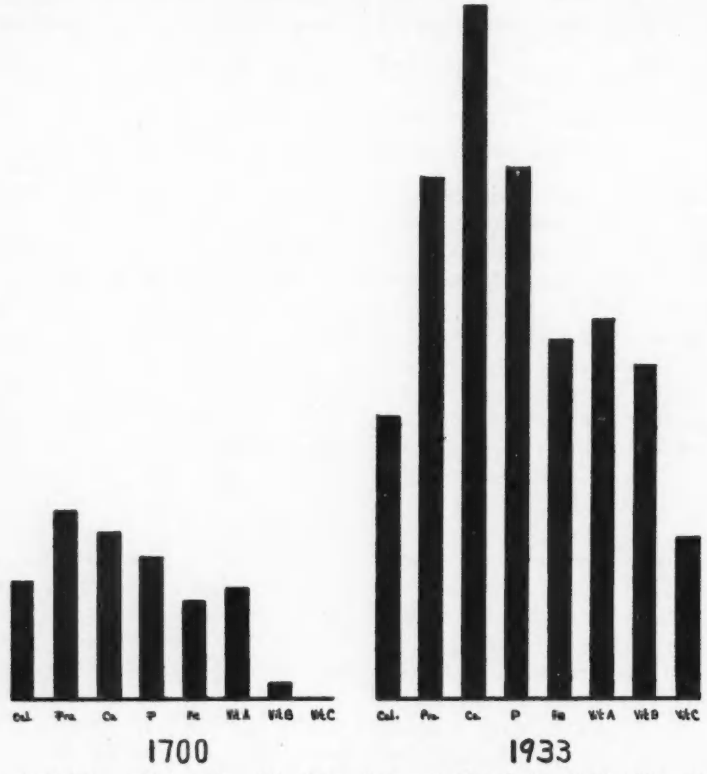

FIG. 1. Relative nutritive value of the diet of the boys in Christ's Hospital in 1700, exclusive of beer, compared with that in 1933. Estimated from data furnished in *The School Boy* (1).

Dr. Richard Budd, physician apothecary to the school in 1770, is said to have introduced potatoes to combat scurvy but it persisted in a mild form as late as 1820. About 1834 the diet was further improved, potatoes being given four times a week instead of two, but the total food increased to about 2800 in the period of 1916–1922 and to as high as 3000 in 1933. Milk from the school's own cows was substituted for beer and the quantity gradually raised to nearly a pint a day. Whole grain bread of excellent quality, good provision of cheese,

butter, meat and eggs and regular inclusion of increasing amounts of other vegetables, along with potatoes, mark a new era in the feeding of school children.

The physical records of Christ's Hospital show what always happens when children are better fed: "a continuous improved trend both in weight and height," with decreased incidence of dental caries, fractures and rheumatism after 1923 as compared with the high incidence from 1917 to 1922. The relation of weight gains to the dietary changes is indicated in Fig. 2.

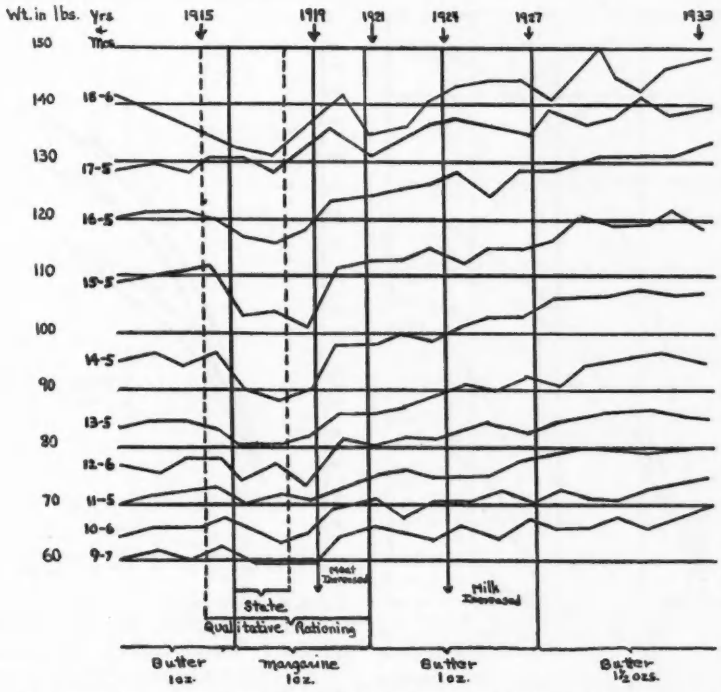

FIG. 2. Changes in weight of Christ's Hospital boys and some of the significant changes in the diet from 1913 to 1933 (courtesy of Dr. G. E. Friend).

The twentieth century has given new control of health, growth and development through food. Increasing consciousness of food as a factor in child health and increasing knowledge of how to choose food to get the best results have brought us not only fuller realization of the magnitude of the problem but a new vision of what health can mean and how food can contribute to human betterment. We have not only new resources but also a new philosophy. In 1900, when Mary Hinman Abel (3) wrote the little book that won a five hundred dollar prize, *Practical Sanitary and Economical Cookery Adapted to Persons of Moderate and Small Means*, she set forth as its aim, "to ward off starvation and the

diseases dependent upon it." That is not enough to meet our present standards, even for the very poor. Sir Edward Mellanby, addressing a conference of nutrition experts called by the League of Nations in November, 1935 to formulate basic nutritional standards for public health in western lands, (4) said most significantly: "We are adopting a new principle here—the only normal child is the excellent child." Commenting on the report formulated by this Commission, Sir John Orr says: "The drawing up of this statement and its general acceptance may well prove to be one of the great landmarks in the history of human progress". Our new philosophy is one of feeding not only for the present good of the child but also for his future development and his contribution as a parent to the improvement of the race.

The effect of improving the diet from time to time through a series of years is also shown by the records of albino rats in the laboratory of physiological chemistry at Yale University. Mendel's (5) studies demonstrated that what had been accepted as the normal weight for the albino rat was far less than could be obtained by comparatively simple improvements in the diet, as indicated in Fig. 3. The weight of this species at 100 days of age was established by Donald-

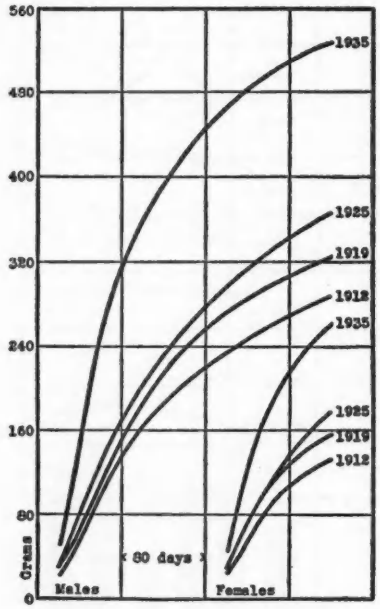

FIG. 3. Effect of improving the diet on the growth of rats. The curves show growth of males from weaning to 280 days and of females until mated at 120 days (Mendel and Hubbell, courtesy of the *Journal of Nutrition*).

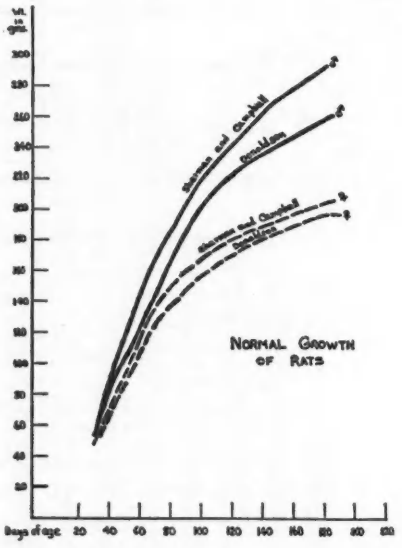

FIG. 4. Improvement in the growth of rats of Sherman and Campbell on an improved standard diet in comparison with the Donaldson curve of Wistar Institute rats on a good stock diet.

son of the Wistar Institute in 1906 as 165 gm. A few years later, on a better ration, in the New Haven laboratories, the standard for that age was raised to 200 gm., and after another 10 years, to 315 gm. Thus during a period of 20 years and under the same environmental conditions, the rate of growth was trebled, with corresponding improvement in growth of bones and inner organs.

Equally impressive is the demonstration by Sherman and his associates of the cumulative effect of a good diet over many generations. In the Columbia laboratory, albino rats fed a mixture of $\frac{1}{3}$ dried whole milk and $\frac{2}{3}$ ground whole wheat with added sodium chloride equal to 2 per cent of the whole wheat for at least 8 generations have given a growth curve for over 300 animals of each sex which definitely exceeds that recorded by Donaldson as shown in Fig. 4 (6).

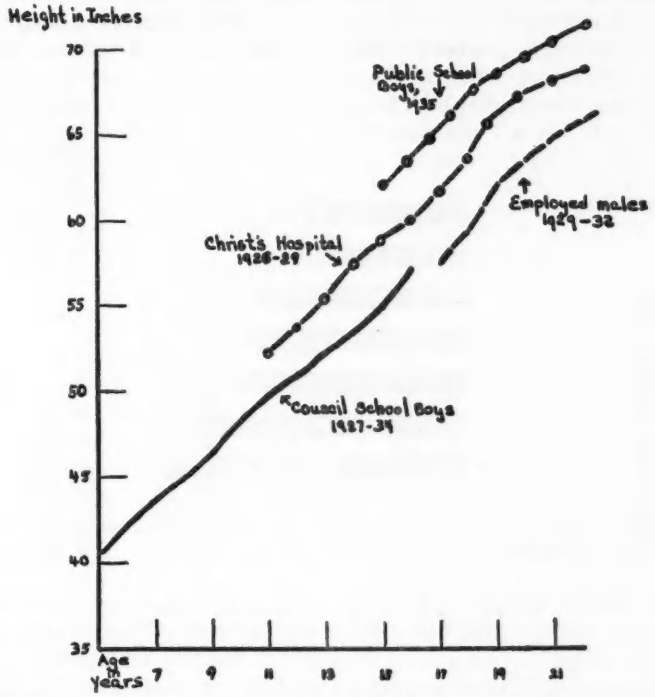

FIG. 5. Heights of boys of lower income groups (Council School boys for ages 5–14 and employed males who leave the Council Schools at age 14) compared with Christ's Hospital boys, 1926–29 and with these and other Public School boys of 1935 for whom data were available. (Courtesy of Sir John Orr.)

A comparison of these improvements in growth through diet with the results of an increasingly good diet at Christ's Hospital School and other schools of England is very impressive. Data col-

lected by Orr (7) are shown in Fig. 5. At the age of 13 years, boys attending Christ's Hospital School are, on the average, 2.4 inches taller than those attending Council schools. At 17 they are 3.8 inches taller than "employed males" who are of the same low income class as the boys in the Council schools.

One of the few controlled feeding experiments with a large number of children over a long period is that of Corry Mann (8), who showed that boys in an institution near London who were believed to be having the best of care

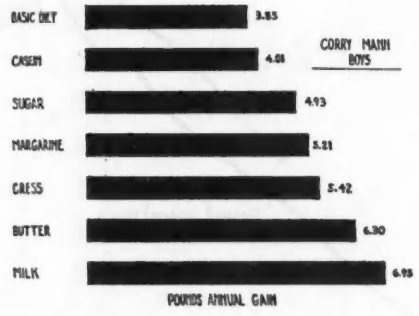

FIG. 6. Average gain in weight per boy in one year on regular institutional dietary (basic diet) and with various supplements (after Mann).

improved markedly in health and growth when to their ordinary diet was added daily a pint of milk. Mann says: "It is startling to learn, as we do now, that the addition of one pint of milk a day to a diet which by itself satisfied the appetite of growing boys, could convert an average annual gain of weight of 3.85 pounds to 6.98 pounds and an average rise in height from 1.85 inches to 2.63".

This study has had momentous consequences. It was quickly followed by one in 1928 on about 1400 children attending the elementary schools in six industrial cities in Scotland and also in Belfast, Ireland, under the guidance of Sir John Orr (9). A daily portion of milk varying from $\frac{3}{4}$ to $1\frac{1}{4}$ pints resulted in 7 months in a 20 per cent increase in the height and weight of the milk-fed groups over those receiving a corresponding number of calories in the form of sweet crackers.

The results were so striking that the Scottish Board of Health was stimulated to make a further year's study of the distribution of milk to school children on a grand scale, involving 20,000 children. The ease with which the milk-fed children could be distinguished from those who had only the same number of calories in crackers demonstrated that the need of improvement in the children's diet was beyond question (10). These studies paved the way for the British Milk-in-Schools Act of 1934, which has made it possible for any child in Great Britain to receive a half-pint portion of milk daily at the cost of a penny.

From all over the world come similar tales. Professors Cerruti and Giuffrida of the University of Turin (11) have recently fed a group of 100 Italian children in a summer camp, 50 boys and

50 girls, 6 to 12 years old, a daily supplement of 250 cc. of milk, the rest of the children on their ordinary diet serving as controls (125 boys and 75 girls). At the end of 50 days the milk-fed group weighed about 20 per cent more than those receiving the usual diet. Only 6 in the milk group failed to gain, while 17 in the control group remained stationary and 22 lost weight. The difference in average gains in weight between the two groups at different ages are shown in Fig. 7.

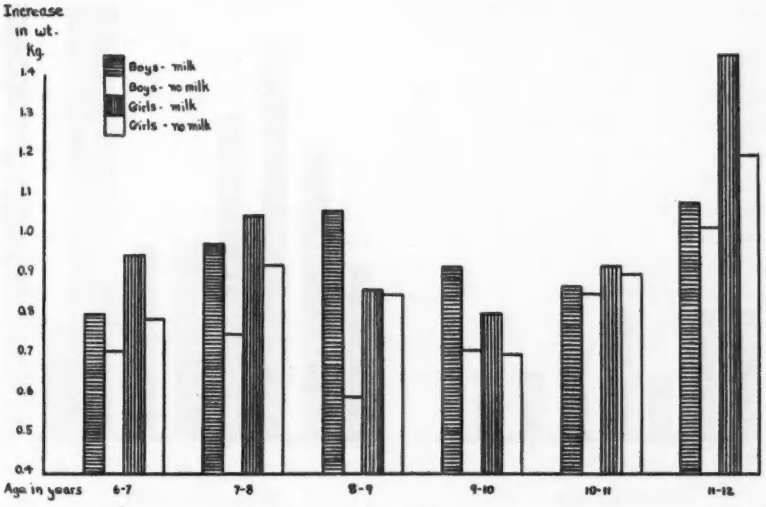

FIG. 7. Increases in weight of Italian boys and girls fed 250 cc. of milk as a daily supplement to the regular diet of a summer camp compared with a group of similar ages serving as controls (after Cerruti and Giuffrida).

A public health bulletin from Japan states that groups of Tokio (12) school children given milk as a supplement to the diet, not only showed greater increases in height and weight obtained, but the children were happier and showed greater promise in athletics, reminding one of the Scottish school girl who wrote after the period of milk feeding, "I can now fight my brother".

The Scandinavians about ten years ago also took a great stride in school feeding. Instead of the hot mid-day meal previously approved for necessitous children, they were persuaded by Dr. Schiotz, chief medical officer of Oslo, to substitute the now world-famous "Oslo breakfast". It is served the first thing in the morning, and requires only the simplest preparation. Every child receives two scones of whole wheat, whole wheat or rye bread *ad libitum*, a piece of cheese, at least $\frac{1}{3}$ pint of milk, reinforced margarine with vitamins A and D equivalent to summer butter, and $\frac{1}{2}$ apple (with orange or raw carrots as alternatives according to season). In a school in Oslo where this was substituted for the conventional hot mid-

day lunch with the same deficiencies as the home diet, the rate of growth in six months increased 48 per cent in boys and 140 per cent in girls, as compared with children in a control school receiving the hot lunch (13).

The very meaning of the word "diet" has changed; it used to be interpreted to mean restriction; today even a so-called "restricted" diet must be carefully kept at the optimum in all possible nutritional factors. Children's diets must be planned with the idea of eating up to the optimum, not down to the minimum, bearing in mind Dr. Ruth Wheeler's wise aphorism: "It is not what is in the menu but what is in the child that counts".

In some of the campaigns for child health in various parts of the country, the goal has been the "five-point child" —one point each for the fingers and thumb of one hand: (1) up-to-weight (2) good posture (3) gocd teeth (4) rosy cheeks (5) bright eyes. Today one may well propose a "five-point diet" for the five-point child.

VITAMIN A

First: Are the reserves of vitamin A adequate? An intimate connection is now established between a liberal reserve of vitamin A and the well-being of all epithelial cells. The effect of this vitamin is seen therefore in every part of the body; and this is not all—other kinds of cells in glands, bones, teeth, nerves and eyes are all dependent on ample supplies. A mere glance at a brief summary of the well-recognized functions of vitamin A makes clear the profound influence of this vitamin.

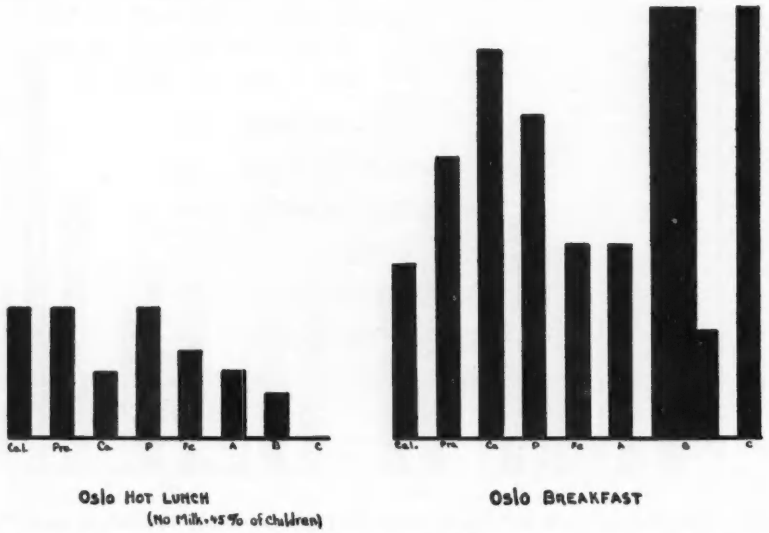

FIG. 8. Relative nutritive value of Oslo Hot Lunch without milk and of the Oslo Breakfast (Estimated from descriptions of the two types of meal.)

Functions of Vitamin A

1. Control of growth
2. Preservation of normal epithelium in:
   - Respiratory tract
   - Alimentary tract
   - Genito-urinary tract
   - Skin
   - Hair
   - Eyelids (conjunctiva)
   - Eyeball (cornea)
   - Ducts of glands
   - Inner ear
   - Gums
3. Control of reproduction
4. Control of lactation
5. Adaptation to darkness (rods and cones of retina)
6. Integrity of nervous system
7. Development and health of teeth (ameloblasts and odontoblasts)

Twenty years ago vitamin A was heralded as the means of preventing xerophthalmia. Today we know that involvement of the cornea and the corneal sac comes relatively late in vitamin A deficiency, whereas hemeralopia, or disadaptation to darkness, is one of the earliest symptoms. As the demand for knowledge in this field has been steadily increasing, there has arisen a need of adequate technics for measuring the impairment of visual capacity in dim light. Vitamin A is essential for the formation of visual purple of the retinal rods and also for another photo-sensitive substance in the retinal cones, known as visual violet (14, 15). The response of both rods and cones to presence or absence of vitamin A is shown in a recent study by Wald, Jeghers, and Arminio (16), of a young man who had previously been found markedly hemeralopic due to vitamin A deficiency, and had been cured by a liberal supply of this vitamin. His responses to giving and withholding vitamin A are shown in Fig. 9. In this experiment he was exposed to an intense light for 4 minutes, the light was then snapped off, leaving him in complete darkness. Light was flashed on the test field at intervals of about 1 second, the intensity being raised systematically until he reported seeing the flash. The left half of the diagram shows the response of cones and rods during 30 days on a vitamin A rich diet (open circles, right eye; closed, left eye); and the right half, the changes which occurred after eliminating vitamin A as far as possible from the diet (only 50 to 200 I. U. per day). After 30 days a dose of 100,000 units of vitamin A was administered and the response quickly became normal, but two days later the subject was again hemeralopic (indicating little or no reserves in his body), and was given a dose of 100,000 units of carotene. After 38 minutes, there was improvement and within 80 minutes normal adaptation. This work and a similar study by Hecht and Mandelbaum (17) open up great possibilities of measuring with remarkable accuracy the responses of the eye to different amounts of vitamin A. The daily intake that will just prevent any sign of hemeralopia is probably close to the minimum requirement. In the case of experimental animals, Guilbert, Miller and Hughes (18) have reported that a level of intake just sufficient to prevent gross signs of night blindness suffices for excellent gains in weight and general signs of well-being for long periods. Three species, cattle, sheep, and swine, show almost identical requirements for vitamin A

per kilo of body weight for the prevention of hemeralopia, 25 to 30 I. U. per kilo daily. Such studies as we have of requirements for man suggest a similar relationship. Studies of dark adaptation in children, of which a great many have now been made, show definitely that children with signs of night blindness acquire normal vision upon vitamin A administration. The results are not yet sufficiently consistent to indicate the extent of body reserves in any given child, but nevertheless these studies warn us of the danger of inadequate supplies of this vitamin. Jeans and Zentmire (19) found that among 400 country and village school children in Iowa about one-fourth of the country children and one-half of the village children showed signs of poor dark adaptation. In England, Maitra and Harris (20) found that of 193 school children examined in London and Cambridge nearly one-third were definitely subnormal in this respect; and in India, Aykroyd and Krishnan (21) have found eye symptoms of a vitamin A deficiency in fully one-fourth of a group of over 400 children in labor camps.

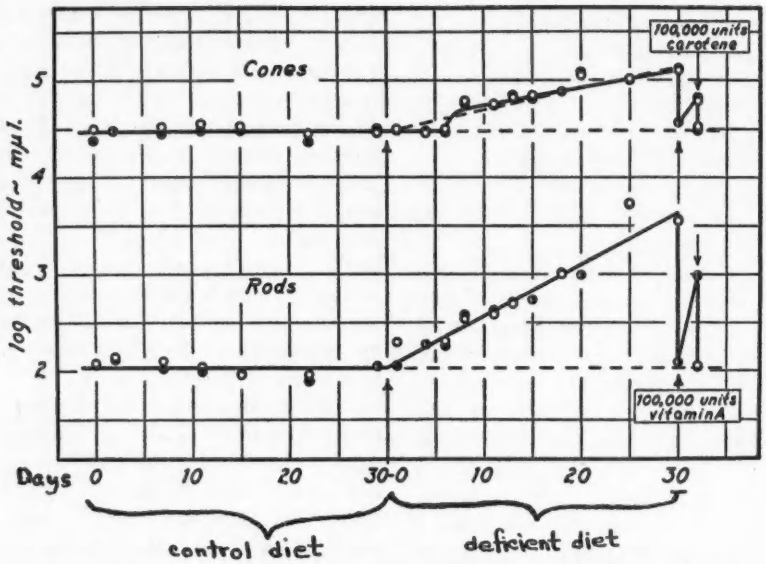

FIG. 9. Thresholds of completely dark adapted cones and rods during 30 days of optimal vitamin A nutrition (left), and during 30 days on a vitamin A-deficient diet (right), with prompt response to vitamin A when administered on the 30th day. (Courtesy of Professor G. Wald.)

The Technical Commission of the Health Committee of the League of Nations at its first meeting outlined a plan for protective foods which would include regularly in the diets of children 3 to 14 years of age approximately one quart of milk, one egg, several ounces of green leafy vegetables, and a teaspoon of cod liver oil (4). Interpreted in terms

of Sherman-Munsell units, this would mean not less than 5000–8000 units of vitamin A daily. Various factors are proposed for converting these to international units. Booher (22) has suggested a factor of 0.5, which would make the equivalent 2500 to 4000 I. U.

Sherman (23) has clearly shown that with successive enrichments of the diet in vitamin A, there are cumulative gains in well-being, as indicated by growth and development, adult vitality, length of life and vigor of offspring, "probably up to at least four fold of the amount which just sufficed to support normal growth and protect from any sign of specific deficiency". We may well set a high goal for vitamin A in the school lunch. At least 3000 Sherman units would seem desirable. This amount will more than cover minimum requirements and whatever is obtained in the home diet may be regarded as extra health insurance.

CALCIUM

For some dietary needs we have no such test of body reserves as we have in the case of vitamin A. Yet somehow we must find the answer to a second question: Is the child growing up calcium-rich or calcium-poor? We shall not easily detect the calcium-poor child, so tenaciously does the body conserve its calcium and use it to maintain the normal processes of metabolism controlled by this element. A white rat, weaned at the age of three weeks and given a diet adequate in all respects save calcium (completely withheld) will grow for many weeks with little difference observable in appearance or size from a litter mate on a calcium-rich diet. Only upon autopsy do we see how the reserves of calcium in the bones have been drawn upon for the daily supplies necessary for the processes of metabolism. In the calcium-poor animal the long bones are thin-walled and the trabeculae so reduced that the end of the bone is merely a hollow shell.

What does a liberal supply of calcium signify so far as general well-being is concerned? Sherman and Campbell (24) have made the first demonstration that a supply of calcium in excess of what is required for normal growth will increase general vigor. Starting with a diet which has served to rear 40 generations of normal animals, they enriched it by increasing only the calcium. The result was an improved rate of growth and a higher level of adult vitality, with retention of the "characteristics of youth" through a longer period of active adult life. The differences in rate of growth are shown in Fig. 10.

In regard to calcium we must pin our faith on the teachings of science and not trust to the outward appearance of the boy or girl. At the present time the only way to know whether a child has plenty of calcium is to see that a liberal supply is taken (along with a liberal supply of vitamins A, C and D, and phosphorus, all necessary to insure its best utilization). The experimental data are in excellent agreement that about a gram of calcium a day is necessary for the best growth. The school lunch that supplies $\frac{1}{3}$ of a quart of milk daily is none too rich in calcium to offset possible shortages in the home dietary.

IRON

In contrast to the concealed nature of calcium shortage is the arresting pallor which we associate with a deficiency of

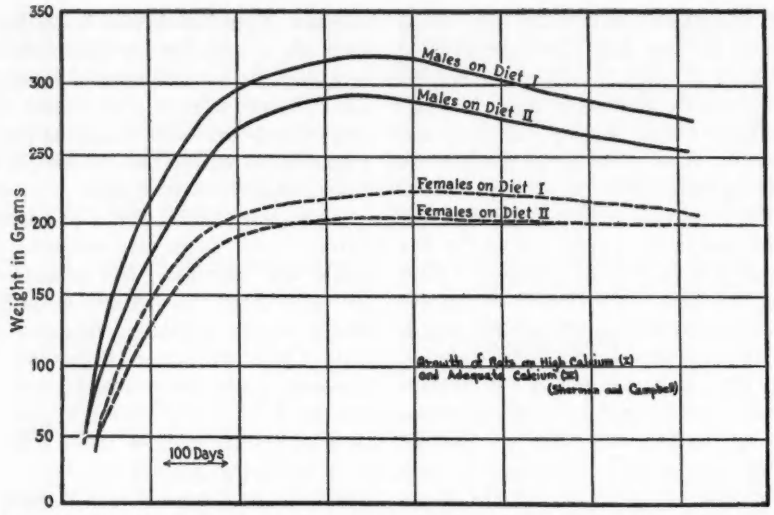

FIG. 10. Records through life of rats on a diet enriched with calcium (Diet I) compared with those of rats on a diet adequate for growth through 40 generations but not so rich in calcium (Diet II). (Courtesy of Professor H. C. Sherman and Dr. H. L. Campbell.)

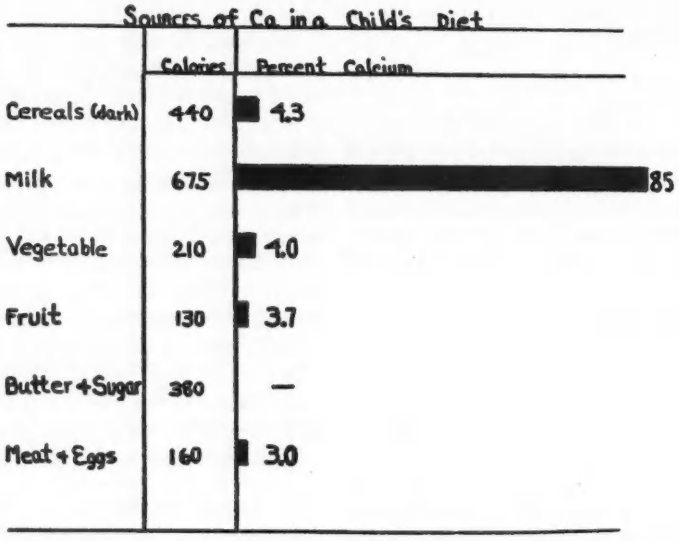

FIG. 11. The importance of milk in a child's diet as a source of calcium is outstanding.

iron. We agree that children should not look anemic, and that if they do, there is a fault in the iron supply or the iron metabolism. But we are not able to detect with the eye mild degrees of anemia which may result in health below par. We must have special means of answering our third question—is the child growing up iron-rich or iron-poor? Dr. Helen Mackay (25), studying the babies in one of London's poorest districts, aroused great interest in the iron needs of children by showing that a degree of anemia generally accepted as "natural" for young babies (much as rickets used to be accepted as "something you grow out of") was a real health handicap.

Among a thousand babies, half of whom were given plain dried milk, while the other half received milk with added ferric ammonium citrate, she found that the iron-fed babies were on the average two to two and one-half pounds heavier after three months of iron administration, had a higher level of blood hemoglobin, a better rate of growth, and a lower rate of mortality for diseases of the respiratory tract and gastro-intestinal system.

In this country, Elvehjem, Peterson and Mendenhall (26) have made a splendid study of the influence of a good diet of natural foodstuffs upon the hemoglobin of children from birth to five years of age. The diet included orange juice at one month, egg yolk at three months, cereal at four months and vegetables at six months. The results for 18 children are plotted along with the average hemoglobin of 750 children brought to the Child Health Nursing Association, Madison, Wisconsin. The values for the special group show an upward trend at an earlier age than those for the children whose diet was not supervised. These figures are in harmony with Mackay's findings that the hemoglobin of infant's blood can be readily increased by a higher iron intake to the great advantage of the children.

It may be noted also that Stearns and Stinger (27) find that a definitely higher intake of iron (1.0 to 1.5 mg. per kilo) is required for steady storage than is needed merely to maintain a good hemoglobin level or to get a positive iron balance.

Further evidence that in this country the iron intake is likely to be too low is indicated by the study of 250 children for a ten-year period now in progress at the Harvard School of Public Health. The nutritionist of the group, Mrs. Bertha Shapley Burke (28), has been investigating among other things the correlation between dietary records of iron intake and the percentage of hemoglobin in the children's blood. Taking the children aged 18 months to 2 years on whom dietary ratings were available and ranking them according to their hemoglobin levels at the two-year examination, she has found that the 10 having the highest hemoglobin (12.2–13.5 gm. per 100 cc. of blood) with one exception had a rating for dietary iron of "good" or "fair", while of the 10 having the lowest hemoglobin, (9.5–10.2 gm. per 100 cc.) all but two were rated "poor".

Rose and Borgeson (29) also found an increased iron intake correlated with higher hemoglobin values in their study of young children to whose ordinary diet was added one egg daily. The difference in hemoglobin values over a two-year period for approximately 20 chil-

dren receiving egg, and a like number carefully paired with them who received colds, throughout both groups, but in spite of the consequently lower hemo-

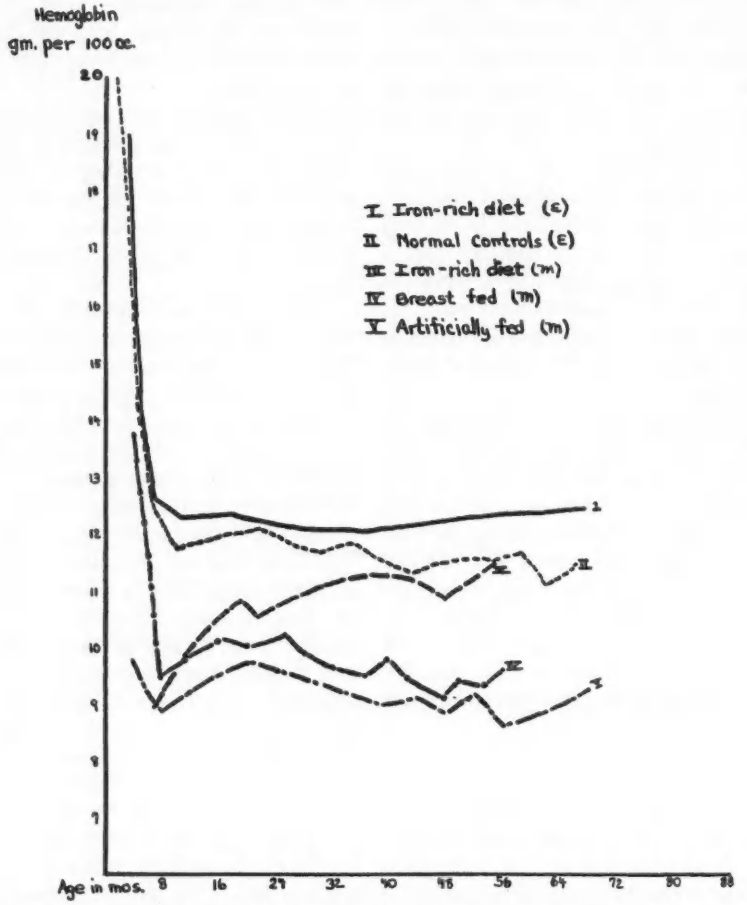

FIG. 12. Infants and young children in Wisconsin whose diet was rich in iron (I) compared with normal controls (II). (After Elvehjem, Peterson and Mendenhall—(E).)

London infants and young children whose diet was supplemented with ferric ammonium citrate (III) compared with control groups, one (IV) breast fed and one (V) artificially fed. (After Mackay—(n).)

similar diets without the egg, is shown in Fig. 13. The second year there were many cases of infection, especially severe globin values, the children receiving egg were less affected than those who did not have the additional iron.

VITAMIN C

The evidence now indicates beyond the possibility of doubt that the child whose tissues are richly supplied with vitamin A, calcium and iron, is far better equipped for his struggle in life than the one forced to live on a low plane with regard to any of these substances. But there is still a fourth way in which we must apply our modern knowledge in order to achieve the "excellent child". We must guarantee him every day an ample supply of vitamin C. Shortage of vitamin C, like that of vitamin A, means widespread damage of the tissues not apparent to the casual observer for a long time. In a study of 18 cases of scurvy in young children made by Park and his associates (30) in 1935, only 2 were diagnosed clinically; in 17, the disease was never thought of as a possibility during life. The scorbutic deformity of the rib, which might have given the clue, was passed over as rachitic in several cases. How can we know to what extent children are in danger of vitamin C deficiency? Harris (31) and others have suggested the study of vitamin C excretion before and after a measured dose of vitamin C, on the principle that if the body is well saturated, a large dose will be promptly excreted; but if the reserves are low, a large part of the vitamin will be retained, and only after some time will the excretion again parallel the intake. Without knowledge of the conditions of absorption, however, the excretion of vitamin C

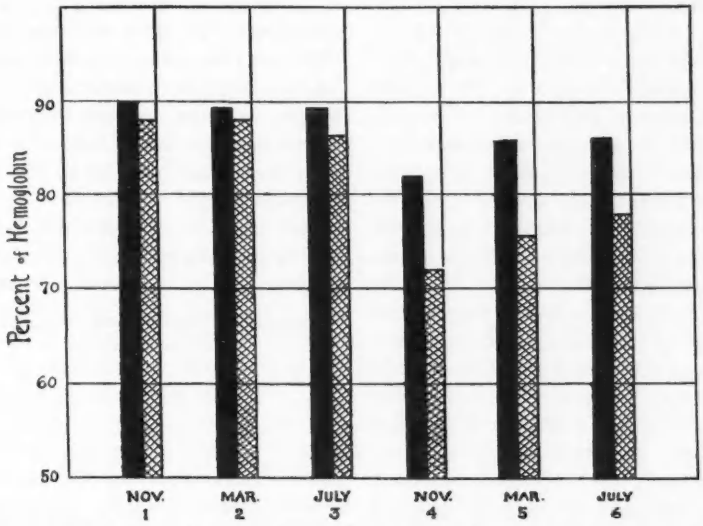

FIG. 13. Median hemoglobin values for a group of children whose iron intake was increased about 10 per cent by addition to the diet of an egg a day (solid black column) compared with a group carefully matched with them, who received no iron addition (cross-hatched column), showing a more marked effect in the second year than the first (*Foundations of Nutrition*).

in the urine cannot be satisfactorily interpreted; there is also the problem of marked loss of vitamin C which occurs in the presence of infection. It has been reported that merely changing the acid-base balance of the food eaten will affect the vitamin C excretion (32).

Capillary fragility occurs with vitamin C deficiency and Göthlin in Sweden and Dalldorf in New York have demonstrated a speedy rise in capillary strength upon administration of orange juice or pure vitamin C to children whose capillary resistance was low. No method can be regarded as adequate at the present time for quantitative measurement of requirement. We must find some way to determine the amount of vitamin C absorbed. Nevertheless, these various tests, even though admittedly crude, when coupled with careful studies of the changes in tissues and organs due to vitamin C deficiency, afford ample justification for every precaution against vitamin C shortage. The relationship of this vitamin to calcium metabolism is of major importance in relation to the growth and repair of bones and teeth and according to Perla and Marmorston (33), arteries, teeth and adrenals are particularly sensitive to injury by toxins when the tissues are depleted of their normal vitamin C reserves.

Many school children do not obtain liberal supplies of orange or tomato juice at home. Furthermore, cow's milk, even if kept in the cold, loses 20 to 30 per cent of its vitamin C in 24 hours, and pasteurization causes loss to the extent of 30 to 60 per cent, while bottled milk, if left half an hour in the sunlight on the doorstep will lose practically 100 per cent. Green vegetables, kept a few days at room temperature, may lose as much as 50 per cent, but will retain the vitamin if kept at or below 30° Fahrenheit. Crushing or bruising causes great destruction and the losses due to cooking are likely to be large. The school lunch service should see that vitamin C is well represented in every meal served. Sixty to 80 mg. ascorbic acid is now regarded as furnishing a good margin of safety for growing boys and girls, being probably at least twice the amount needed to prevent scorbutic symptoms. Dr. Mary de Garmo Bryan (34) in *The School Cafeteria* states: "A raw fruit or a vegetable such as lettuce, cabbage or carrots should be served each day in the form of a sandwich or a salad in order to insure an adequate supply of vitamin C." The school lunch of this type may readily yield a third of a good daily allowance of vitamin C as demonstrated below:

Economical School Lunches Adequate in Vitamin C

I

	Calories	*Vitamin C mg. ascorbic acid*
Milk	228	5
Cheese-lettuce sandwich	330	1
Carrot-cabbage salad (2 tbsp. lemon juice)	240	21
Apple	80	6
	878	33

II

Milk	170	4
Cream of tomato soup	200	19
Crackers	100	
Egg sandwich	340	1
Banana	100	9
Total	910	33

VITAMIN B_1

The five-point diet must be adequate for the maintenance of good appetite and good digestion. Admitting that many factors in the environment and the character of the food determine whether the child will eat or not, there should be

a strong enough inner urge for food to carry the normal child safely past a great many minor obstacles. Experimentally, loss of appetite is the first symptom of vitamin B_1 deficiency, and prompt disappearance of the anorexia follows administration of the vitamin. Among many observations of impaired alimentary function may be mentioned clinical studies by Fitts (35) who found that definite changes in the motor and secretory mechanism resulted from a long-continued slight deficiency of vitamin B_1 and that rapid improvement occurred when the intake was increased. Vorhaus, Williams and Waterman (36) selected 8 cases especially for treatment because of poor tonus of the alimentary tract with failure of appetite. Six of these were quickly brought to normal by vitamin B_1 therapy and the other two greatly improved. Investigators too numerous to mention have found marked improvement of appetite and digestion of infants and children when their vitamin B_1 intake was increased. Recently Schlutz and Knott (37) have studied 54 children, 11 years old, living in institutions on well-planned dietaries. To one group was given extra vitamin B_1 as whole wheat cereal for one period, whole wheat plus wheat germ for another, wheat germ alone for a third, crystalline vitamin B_1 for a fourth. These additions increased the vitamin B_1 intake from 10 to 15 per cent. The regular diets furnished 260 to 420 I. U. per day; and the supplements, 120 to 250 I. U. It appeared that the addition of as much as 150 I. U. was required before appetite was definitely increased, as shown by the food consumption records. This would mean total intakes of 400 to 600 I. U. as desirable for children approaching adolescence. While vitamin B_1 is present in virtually all animal and plant tissues, the concentration in most of them is very low—under one part per million. Many fruits and vegetables do not yield more than half a part per million. The following table prepared by Williams (38) shows the relatively small number of the more important sources—foods having two or more parts per million.

Important Sources of Vitamin B_1 (Thiamin)

Gamma per gm. (I.U. = 3.33 gamma)	
2–3.....	Egg yolk
	Liver
	Maize
	Milk, dried
	Peas, fresh green
	Pork, muscle
	Rice, unpolished
	Rye, whole grain
3–4.....	Oats
	Whole wheat
20.....	Baker's yeast, dried
40.....	Wheat germ
70.....	Brewer's yeast, dried

It is very easy to choose an attractive menu adequate in other respects but dangerously low in vitamin B_1, as the following dietary shows:

*An Attractive Day's Menu Furnishing 2800 Calories and Adequate in Protein, Phosphorus, Iron, Vitamins A, C and G**

	Calories	*Vit. B_1 I.U. (estimated)*
Breakfast		
Apple.....	80	16
White farina, cream and sugar.....	350	—
Toast (white bread) and butter.....	200	—
Coffee, cream and sugar.....	100	—

* Vitamin D is not considered here, since this should be obtained by exposure to sunshine or from some special source.

	Calories	Vit. B_1 I.U. (estimated)
Luncheon		
Beefsteak (lean)	200	16
Beets	80	8
Lettuce salad (French dressing)	100	9
Rolls and butter	200	—
Cake	200	—
Coffee, cream and sugar	75	—
Dinner		
Grapefruit juice cocktail	75	16
Roast lamb	250	20
Mashed potatoes	200	2
Broccoli	75	20
Celery	10	—
Apple pie	200	10
Rolls and butter	150	—
Coffee, cream and sugar	75	—
Total	2620	117
Desirable Intake		300–500

Drummond has pointed out that in Great Britain the diet of those provided for under the Poor Law a century ago, wretched as it was from other points of view, being mainly bread, gruels and thin broths, gave the inmates no less than 1000 I. U. of vitamin B_1 per day, whereas at the present time analyses of British family food budgets by Orr (7) indicate that the daily intake ranges from about 200 I. U. at the lowest income level to about 500 at the highest.

Stiebeling, studying large groups of the American population from different economic levels obtained figures for vitamin B_1 quite similar to those reported by Orr, from 235 I. U. at the lowest income level to 485 I. U. at the highest. She says, "of the nutrients considered, protein appears to be the one most abundantly furnished with reference to need, and calcium, iron and vitamin B_1 least (39)." Williams has compared the vitamin B_1 content of the Stiebeling study with that of Oriental diets which induce beriberi and finds the ratio of vitamin B_1 to total calories in many instances as low as in diets which induce beriberi. The American is protected by the greater adequacy of his diet in other respects and by its relatively high proportion of fat with its vitamin B_1 sparing action. Nevertheless, we need a consistent program for insuring people generally a more adequate supply of vitamin B_1. For the poor, the liberal use of whole grain cereals, especially in bread, is the simplest course at present. Gillett points out that one cent invested in whole wheat bread in New York City (the additional cost over the white loaf) will furnish an amount of vitamin B_1 which would cost at least 15 cents in other foods. Whole grain bread is the best staple for vitamin B_1 because the commercial preparation of many breakfast cereals destroys a very considerable part, if not all, of the vitamin B_1; hence, in our teaching of cereals in schools we must make clear that a brown color, *per se*, is not a guarantee of vitamin B_1.

Furthermore, in the case of vegetables there is danger of loss from heating and from discarding cooking water. Funnell found that peas cooked 15 minutes lost about 25 per cent when no cooking water was thrown away. Fruits, though more frequently eaten raw, or if cooked, without discarding the water, cannot be regarded as an important source of vitamin B_1 with the exception of oranges, which in a child's diet frequently furnish as much vitamin B_1 as one quart of milk.

The requirement for vitamin B_1 is closely related to the total energy requirement and hence is high in childhood because of high basal metabolism and

high cost of activity. The Nutrition Commission of the Health Committee of the League of Nations at its third meeting set a tentative standard of 10 I. U. per 100 calories for the adult, and 10 to 15 I. U. per 100 calories for infants, and a suggested daily total of 200 to 250 I. U. for nursery school children (40).

NUTRITION EDUCATION

For further progress in nutrition and health, it is now essential that every potential parent, *i.e.* every boy and girl in our schools today, learns how fundamental to successful living is good nutrition. The development of habits which make for optimum nutrition is wholly a matter of education. There is no instinct for a good diet—apparently quite the contrary. Beriberi increases in the rural portions of the Philippine Islands because the natives have learned more effective ways of polishing rice! The use of sugar, white bread and coffee, the worst feature of the American diet, seems to be a custom most quickly copied by foreigners. Drummond says "I have met men who have fallen victims to scurvy without even once experiencing a desire to eat a protective food, and, indeed, under conditions where fresh fruits are constantly at hand." As Roberts has aptly remarked, "a child in a peasant home, where the diet consists solely of simple, natural foods like milk, whole rye bread and cabbage, can probably be trusted to eat the kind and amount of food he desires. To apply the same rule to a child in an average American home would be disastrous" (41). How could a child discover for himself the need of a dietary constituent, when even complete deprivation of it might not manifest its effects in any external way for years?

It has taken years of laboratory research involving thousands of animals to discover that there is a wide difference between a diet which is adequate for the maintenance of the adult and one which will support the best growth; and again a difference between one which will bring the young to a state of apparently normal maturity and one which will provide for the needs of pregnancy and lactation. This knowledge we must prepare to pass on for the benefit of the children now growing up and their children and their children's children. To take an "A" lunch may be much more important for a girl's future than an "A" in history or geometry.

But the task is not simply to provide suitable food. Children must learn to make wise choices for themselves. In the experimental elementary school of Teachers College known as the Speyer School there is a high proportion of children who need desperately the protective values in whole grain bread and raw vegetables because their families are very poor. So in the nutrition teaching which is done there much time has been given to the problem of making whole wheat seem important to the children. The children for the most part receive at school the emergency relief lunch provided by the city (42). In the schools at large, where the lunches are served without any special educational nutrition program, it has taken seven years to "sell" whole wheat to the children. In two years in this school a steady demand for whole wheat sandwiches has been created. The white bread sandwiches have sometimes been discarded and left on the floor, but never

those made of whole wheat bread; and a higher proportion of whole wheat is provided regularly for this lunchroom. One mother came to the school to inquire what was the matter with the sandwiches she gave her son; he was trading them every day for the school lunch sandwiches. Hers were made of white bread and the school's of whole wheat! Another mother came to find out why the school lunch director was requested to furnish more raw vegetable sandwiches to meet the demand of the children. In other schools they are frequently refused and sent back.

In order to bring all influence to the side of right choice, we need in every school well-informed teachers who will cooperate with a trained cafeteria manager. In the lunchroom right choice

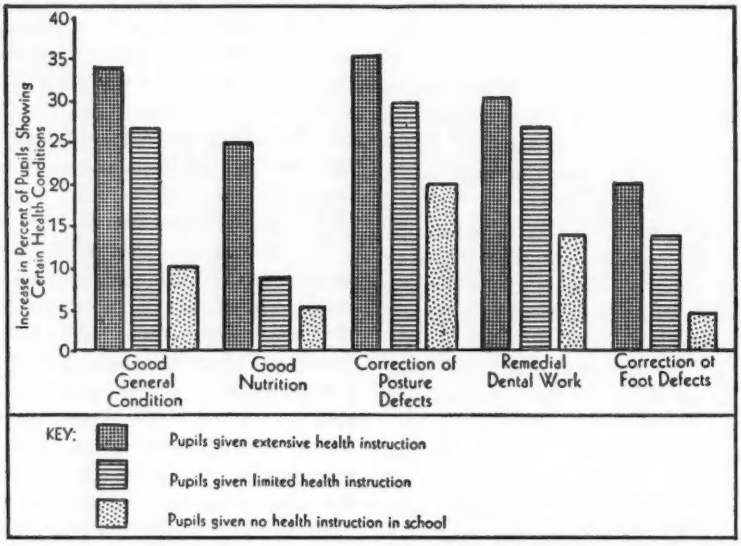

FIG. 14. Health improvement of pupils as related to extensiveness of a health education program in Joliet, Illinois, during a three-year period (Courtesy of Dr. H. M. Hardy and the Elizabeth McCormick Memorial Fund).

her child would not eat white farina any more.[2]

A great deal of attention has also been given to raw carrots and raw cabbage, which are cheap enough to be within the reach of almost everyone. Raw vegetable sandwiches appeared in various forms in many lessons, and then should be made easy and should receive recognition. Wrong choice needs to be corrected. In the Lincoln School of Teachers College if a child repeatedly makes wrong choices, his teachers and parents are conferred with, and every kind of pressure brought to bear to make the sinner mend his ways.

Some tangible evidence that education for health brings results has been fur-

[2] For an outline of some of the instruction given, *see Our Cereals* (43).

nished by the Elizabeth McCormick Memorial Fund, so long interested in developing efficient and practical methods for health education (44). An appraisal of health education programs conducted during a three-year period in a number of elementary schools in Chicago and in Joliet, Illinois, shows that in both cities pupils who participated in the health instruction projects were in better health following a more hygienic schedule of living at the conclusion of the instruction. At the start, the non-instructed pupils were healthier than the others; at the final health examination the advantage was very definitely with those having had health instruction. Pupils given extensive health instruction made definite improvement in every item considered, including the physician's summary ratings in physical condition, measures of nutrition, muscle tone, posture, adequacy of diet, etc. Remedial work, the report points out, depends primarily on the parents, but increased interest was most pronounced among parents whose children participated in the extensive instruction projects. While consumption of fruit was the only food habit surveyed in which the non-instructed children showed definite improvement, improvement in dietary practices was clearly shown for all food habits inventoried in the case of the extensively instructed pupils.

More and more do we now see our specific goals in the feeding and nutrition education of our growing children. More and more we realize the points which need special safeguarding. We shall do a great deal to make possible the five-point child if we constantly give attention to the five points whose significance has been briefly indicated in the foregoing pages.

That we may all fix these on our minds and hearts, I offer in conclusion, the following covenant of faith for all school dietitians:

1. I believe in the optimum diet for every child.
2. I believe in establishing and maintaining reserves of vitamin A in every child's body until he has reached maturity.
3. I believe in a regular, optimal daily supply of calcium, to the end that children may reap the benefits of the calcium-rich life.
4. I believe in a diet rich in iron so that there may be protection against losses due to infection, and that there may be a high hemoglobin level to insure vitality and vigor.
5. I believe in the protective value of a diet rich in vitamin C, which safeguards tissues all over the body and contributes to buoyant, in contrast to passable health.
6. I believe in a liberal supply of vitamin B_1 every day, to be carefully planned and not left to chance, as a means of conserving appetite and digestion to meet the high food requirements during the whole period of growth.
7. I believe in the education of the community to the school lunch as an integral part of the educational program.
8. I believe in the education of teachers to cooperate in the school nutrition program and to uphold the cafeteria manager in her efforts to provide a lunch of high protective value.

9. I believe, with Sherman, that "There is no limit at present in sight or predictable, to the extent to which, by taking thought and using the guidance which science now offers, one may build to ever higher levels of positive health, of efficient service, and of resultant satisfaction in life."

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WHAT THE DIETITIAN SHOULD KNOW ABOUT PROTAMINE INSULIN[1]

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PROTAMINE zinc insulin is here to stay, at least until it is replaced by something superior in the treatment of diabetes. Since its introduction in this country about three years ago it has become increasingly popular and at present it is the insulin of choice in many clinics. It is advisable, therefore, that the dietitian have a clear conception of its nature, action, superiority to regular insulin, limitations and, finally, of the influence its use has on the dietary aspects of the treatment of diabetes.

PROPERTIES

Regular or unmodified insulin is a complex protein (or a zinc salt of a protein) dissolved in a weak acid. Like other solutions of proteins it can be precipitated out of solution by various chemicals, among which are a group of compounds known as protamines. These are protein-like compounds that occur in large amounts in the sperm of various fishes. Protamines are composed of comparatively few amino acids, are strongly alkaline in reaction and by virtue of this fact are able to precipitate proteins. It occurred to Hagedorn of Copenhagen that if insulin could be precipitated as a fine emulsion before its introduction into the body the action of the insulin could be delayed. Consequently, some of the difficulties attending the treatment of diabetes could be eliminated because the insulin first of all would have to be redissolved before it could begin its work. After a great deal of experimentation Hagedorn found that when various protamines were added to regular insulin the resulting precipitate of insulin was only slightly soluble in the tissue fluids. He finally determined that a protamine, extracted from the sperm of a species of fish known as *Salmo eridius*, yielded when added to insulin a precipitate that had the desired physical properties and was the least soluble in tissue fluids of all the protamine insulins that he had studied. Furthermore, as he had anticipated, its rate of absorption and consequently its action were delayed.

ACTION

As might be anticipated, the general effects that follow the injection of protamine zinc insulin are essentially the same as those that occur after an injection of unmodified insulin; that is, among diabetic patients the blood sugar is decreased in amount, sugar ceases to be excreted in the urine, glycogen once more is stored in the liver, ketosis is controlled and destruction of the protein of the body ceases. Thus, the action of protamine zinc insulin differs chiefly from that of unmodified insulin in the rate at which these effects are produced and in their duration. It will be recalled that after the administration of unmodified insulin the concentration of the blood sugar begins to decrease within the first half hour and that this decrease continues rapidly for another four to six

[1]Read before the opening General Session, American Dietetic Association, Milwaukee, October 10, 1938.

hours. As soon as the effect of unmodified insulin has ceased, the blood sugar again begins to increase in amount so that after, let us say, twelve hours, the value for the blood sugar again may be as high as it had been before the administration of insulin. In contrast, an injection of protamine zinc insulin produces very little effect on the concentration of the blood sugar for the first four to six hours after it has been injected. At the end of this time the amount of sugar in the blood slowly decreases and reaches its lowest concentration twenty to twenty-four hours after the protamine zinc insulin is administered, but the concentration of the blood sugar may remain at a low level for an additional twenty-four or forty-eight hours. The entire duration of this effect probably depends in part on the amount of protamine zinc insulin given, the degree of severity of the diabetes and possibly other factors not known. One of the important consequences of the prolonged action of protamine zinc insulin is the fact that if food is not taken insulin reactions occasionally may occur forty-eight or even seventy-two hours after injection.

Also, because of the prolonged action, the full effects of a change in dosage do not become apparent until about the third day. Hence, changes in dosage ordinarily should not be made more frequently than every fourth day.

ADMINISTRATION

Protamine zinc insulin, like unmodified insulin, must be given hypodermically. The material as it is purchased consists of a liquid containing a fine suspension of precipitated insulin. The liquid portion is physiologically inert and the activity is in the insoluble portion that settles to the bottom of the container. Hence, it is necessary to mix the contents of the bottle. This can be done by gently inverting the bottle several times; vigorous shaking will produce foam that interferes with accurate measurement of the dose. In many instances, especially if the diabetes is mild, the entire dose of insulin for one day can be given in one injection before breakfast. The exact time of its administration is not so important as it is when regular insulin is used.

Patients having moderately severe or severe diabetes not infrequently require small amounts of unmodified insulin to supplement the protamine zinc insulin, in order to keep the urine reasonably free of sugar. The reason for the use of both kinds of insulin arises from the fact that although the administration of protamine zinc insulin will prevent sugar from appearing in the urine that is excreted during the night, often it will not prevent sugar from being excreted after meals. In such instances a further increase in the dosage of protamine zinc insulin may produce violent insulin reactions early in the morning. Usually, only one or two small supplementary doses of unmodified insulin are necessary. One of these is taken before breakfast and the other before the evening meal. The unmodified insulin should not be mixed with the protamine insulin but should be given as a separate injection.

There is a small group of patients whose urine cannot be kept entirely free of sugar by the administration of regular and protamine zinc insulin in any combination. Provided that the excretion of the sugar can be kept at a low

level, such patients feel comparatively well if a small amount of sugar is present in the urine. Whether or not this small amount of sugar in the urine predisposes to the development of arteriosclerosis still is a disputed point, although most authorities at present are inclined to the opinion that it does not. The persistence of a large amount of sugar in the urine is decidedly undesirable and should be prevented.

ADVANTAGES

Protamine zinc insulin unquestionably has proved to be of great value to the vast majority of diabetic patients who require insulin. From the patient's point of view the great advantage of protamine zinc insulin is that frequently its use reduces the number of injections that are necessary daily to control the disease. With its use it is rarely necessary to give any insulin at the noon hour. Prior to its introduction a number of patients had to take an injection of insulin at 10 p.m. in order to avoid excretion of a large amount of sugar during the early morning hours before breakfast and immediately thereafter. In such instances, if the nocturnal dosage of insulin was not estimated carefully, severe insulin reactions occurred during sleep. Insulin reactions that occur during sleep usually are likely to be particularly severe because the patient is unaware of the early and mild symptoms; consequently treatment cannot be instituted promptly. Because of this danger many patients with severe diabetes preferred to excrete large amounts of sugar at night or in the early morning hours rather than run the risk of severe reactions. Protamine zinc insulin has almost eliminated not only the necessity of nocturnal injections of insulin but also, when used properly, much of the danger of severe nocturnal insulin reactions.

Some patients who have what is known as "brittle blood sugars" frequently can be treated more successfully with protamine zinc insulin than with unmodified insulin. These patients have always been and still are difficult to treat. In such cases the blood sugar oscillates, for reasons that are not clearly understood, from extremely high to extremely low concentrations. When such patients take enough unmodified insulin to control the sugar in the urine they are on the verge of an insulin reaction; and when they reduce the dosage of insulin to avoid insulin reactions, considerable amounts of sugar appear in the urine. These wide fluctuations that occur in the concentration of the blood sugar often can be ironed out to a considerable degree by the judicious use of protamine zinc insulin, supplemented by regular insulin and by careful adjustment of the diet. However, protamine zinc insulin is by no means a panacea for this type of patient.

A large number of patients insist that they have felt better since they have been using the new type of insulin. Some of these patients probably feel better simply because they are using something new in the treatment of their disease, others because the control of their diabetes is less of a nuisance and still others for more valid physiologic reasons. In any event the number of such patients is large enough to give credence to their statements.

DISADVANTAGES

Some of the disadvantages of protamine insulin are also applicable to unmodified insulin and result from the

fact that at present there is no substitute for the delicate regulating apparatus that in healthy individuals controls the concentration of the blood sugar with nicety, in spite of the action of powerful influences that tend to change it. In short, an injection of any kind of insulin is at best a poor substitute for a normally behaving pancreas. However, there are certain disadvantages that are peculiar to the use of protamine zinc insulin. First of all, its prolonged action is not always an unmitigated blessing. For example, if a patient taking large doses of protamine zinc insulin suddenly becomes ill and is unable to eat there is sometimes considerable danger of severe insulin reactions occurring many hours after the last dose of insulin was taken. I recall one patient who had severe reactions that required an injection of glucose on the second and third days after the last dose of protamine zinc insulin. True enough, this case was exceptional; nevertheless, that particular problem would not have arisen had regular insulin been used.

Furthermore, it is easy for patients persistently to take more protamine zinc insulin than is necessary. The symptoms of the reaction that follow an overdose of unmodified insulin are usually definite, the relief that results from treatment, prompt. Consequently the relationship that obtains between the cause and effect is easily recognized both by patient and physician. In contrast, the cause and effect relationship between an overdose of protamine insulin and the ensuing insulin reaction is not so easily perceived because of the prolonged lapse of time between injection and reaction. Furthermore, the symptoms of the reaction are not dramatic. Fatigue, irritability, morning headache, and nausea are among the more common of such unrecognized symptoms. In addition, the insulin reaction may recur in waves after it has once been alleviated. It is evident, therefore, that in order to obtain in difficult cases the maximal amount of benefit from the administration of protamine zinc insulin, the physician must be skillful and the patient intelligent. In this connection it might be pointed out that native intelligence on the part of the patient and proper instruction of the patient are required if unmodified insulin is to be used advantageously and that even more thorough instruction of the patient is necessary if patients are to use properly both forms of insulin simultaneously. Fortunately, diabetic patients comprise on the whole a highly intelligent group, even though they may not act so when they are "loaded with sugar."

A few patients, especially those having severe diabetes of relatively long duration, do not get along as well with the use of the new type of insulin as they did with the old. Patients who have severe diabetes and who are getting along nicely by using unmodified insulin should not be urged to change to protamine zinc insulin. Some of the patients in this group find that control of the sugar in the urine is less satisfactory with protamine zinc insulin, that reactions are more troublesome and that these disadvantages outweigh the convenience of being able to omit a dose of insulin at noon or at bedtime.

RELATIONSHIP TO DIETETICS

Dietetics may be defined as the artistic application of the science of nutrition. Those of you who remember struggling with ketogenic-antiketogenic ratios and

diets containing 40 to 50 gm. of carbohydrate will appreciate the full significance of this definition. Fortunately for all concerned, such diets are necessary no longer. After the discovery of insulin, the diets for diabetic patients promptly became more palatable than formerly and from year to year the amount of carbohydrate in the dietary of the diabetic patient was gradually increased. In fact, at present some authorities permit their diabetic patients a diet entirely unrestricted in carbohydrate. This point is mentioned merely to illustrate the general trend. The arguments for and against such a program need not concern us at the present. With the advent of protamine zinc insulin this tendency to make the diet for diabetic patients approach the "normal" has become noticeable even among the conservative specialists in diabetes. There are no indications that this tendency will cease or that the former rigid methods of dietary restriction will ever be reinstated. There are good reasons to believe that gradually the diets in general use for diabetic patients today will be even more liberal in their carbohydrate content in the future If this proves to be the case more emphasis will be placed on the palatability of the diet, its constancy from day to day and its suitability for the particular patient, rather than on its exact chemical constituents.

THE HEALTHY DIABETIC CHILD[1]

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ADEQUATE treatment of the diabetic child consists chiefly of two factors: proper nutrition and satisfactory social adjustment. First, the teamwork of the doctor, nurse, dietitian and parents and their mutual understanding of the problem and the plan of treatment are essential. The mother and the child should be instructed in the technical aspects of the ordinary care of diabetes mellitus. This includes preparation of the diet, injection of insulin and examination of urine as well as sufficient information for the recognition and treatment of insulin shock and information concerning the early signs of coma.

The creation of an attitude of "normalcy" on the part of the child and his family is the second essential. A diabetic child must learn that he can lead a "normal" life, that his only distinction from other children is a lack in the production of insulin which needs to be supplied by artificial means. It is necessary that all who participate in the care of diabetic children recognize this psychologic aspect. The child should not only attend school but should also enter into extracurricular activities to which he is naturally attracted. Above all, care should be taken that he does not consider himself an invalid nor ask for special consideration because of his diabetes.

Before the introduction of insulin, the treatment of diabetes mellitus was essentially dietary. In the early part of this century, the high-fat, low-carbohydrate diet was popularized, and about 1916 Allen showed that the length of life of the average diabetic child could be extended by the employment of the so-called starvation diet. For some time after insulin became available in 1922, there was a tendency to cling to the low-carbohydrate, low-caloric type of diet. In 1926 there appeared several publications advocating higher carbohydrate diets. The chief difference in these several diets was that they varied from those with a low caloric intake to those adequate for growth and activity. There is not yet complete agreement about the type of diet to be employed. If one analyzes the various diets advocated by different authorities, it will be found that they can be divided roughly into certain categories. From a quantitative standpoint there are, as already stated, variations ranging from those which lead to moderate underweight to those completely adequate for normal growth and activity. There are also differences of opinion concerning the need for measurement of the diet, some authors advocating accurate measurement and others unrestricted diets. Qualitatively, the variations are largely in the carbohydrate and fat portions which range from high-carbohydrate, low-fat, to high-fat, low-carbohydrate, with all gradations between these extremes. There is general agreement that protein, minerals and vitamins should be adequate.

Exact evaluation of the various diets

[1] Read before the Ohio Dietetic Association, Columbus, Ohio, April 6, 1938.

now employed is not possible because of the lack of adequate methods for the determination of their relative efficacy. Apparently, diabetic children can be satisfactorily treated on most of these dietary plans. If this is so, it is clear that we are not ready to speak in terms of the optimum diet, but rather of the merits of a particular diet or, perhaps more accurately, of the range of the adequate diet. The fact that a particular dietary plan has resulted in the satisfactory control of a group of diabetic children does not necessarily indicate that other dietary prescriptions may not be equally satisfactory when other factors are taken into consideration. It is possible that there has been a tendency to draw conclusions too quickly and to be too much impressed and even biased by personal experience or by the experience of those with whom we have worked. If we are to advance our knowledge in the dietary field, it would appear necessary to avoid making definite deductions from incomplete evidence.

TABLE 1

Essentials of diet for diabetic children

1. Sufficient calories for growth and activity
2. Adequate protein, minerals and vitamins
3. Ketogenic-antiketogenic ratio of not more than 1.5
4. Adequate to satisfy appetite
5. Variation to avoid monotony
6. Sufficient approximation of average diet to permit entire family's partaking of it
7. Choice of foodstuffs compatible with financial status of family

Although a wide range is possible in the prescription of diets, working rules or formulae are essential in the practical care of diabetic children. The important point is that, considered as such, they should remain flexible.

The first step in the treatment of the diabetic child who is not in coma or who has been brought out of coma, is the prescription of a diet. The initial diet is merely a "starting diet" and must be adjusted to the individual child to satisfy his needs for growth and activity as well as his appetite. Insulin must be supplied in sufficient quantity to prevent excessive glycosuria and yet not result in frequent shocks. Both the diet and the insulin must be adjusted from time to time for the individual child in order to satisfy the demands of growth and activity and to allow for intercurrent infections when these occur. The requirements of a satisfactory diet are shown in table 1.

The initial or starting diet may be either basal or adequate—"basal" implying only sufficient caloric value for maintenance at bed rest and "adequate" that there is added sufficient caloric intake for growth and activity. If there is no reason for keeping the child in bed, our practice is to allow as much activity as the routine of the hospital will permit and to start with an approximation of an adequate diet. The caloric value of the initial diet is estimated on the basis of a weight slightly less than that expected for age and height. Both clinical and experimental data furnish strong evidence against the initial employment of a starvation diet to determine the glucose tolerance. There are several empiric methods for the determination of the quantity of the diet such as the average total caloric requirements for age and body size, calories per pound of body weight and calories per square meter of body area. There are

also numerous tabular methods. In general there are no essential differences in the diets written according to any of the plans. The formulae which we have employed in recent years are shown in table 2.

These diets are based on several factors: (1) average caloric requirements of approximately 32 to 27 per pound of body weight for children from 5 to 12 years of age; (2) at least 1 gm. of protein per pound of body weight for the younger children, with slightly less for the older child; and (3) a ketogenic-antiketogenic ratio of less than 1.5. While no essential differences have been detected in the response of the children to any of these diets, we tend to employ Diet No. 3 more frequently than the others. However, it is only fair to state that in actual practice these formulae are used only as guides and the amounts of carbohydrate, protein and fat are often varied 5 to 20 gm. in either direction on the basis of the "clinical guess" of the need for the individual child. We rarely prescribe diets containing more than 220 gm. of carbohydrate. After the child has had the initial diet a sufficient length of time to stabilize the insulin dosage, we determine whether this diet is satisfactory from the standpoint of the child's growth and whether his appetite is being satisfied. It is usually necessary to make adjustments. If the child's gain in weight is too little, the total caloric intake is increased; if the gain is too rapid, the caloric value of the diet is reduced.

When the appetite is not satisfied and the weight curve is satisfactory, the bulk of the diet is increased without increasing the total caloric intake. On the other hand, it is occasionally necessary to decrease the bulk in order to secure a satisfactory intake. It is practically impossible to treat successfully a diabetic child unless his appetite is satisfied. This can be accomplished without the employment of proprietary diabetic foods.

The amount of insulin to be injected is estimated from the qualitative analysis of the urine for sugar. Specimens of urine are collected upon arising in the morning (from 7 to 8 a.m.), 11 a.m., 4 p.m. and 8 p.m. The insulin, either regular or protamine or a combination of the two (1), is increased rapidly until there is not more than a trace of sugar in the urine and then is gradually reduced until a reasonable state of glycemic equilibrium is attained.

TABLE 2

Examples of starting diets

NUMBER OF DIET	GMS. PER LB. OF BODY WT.			CALORIES PER LB. BODY WT.	K/AK*
	Carb.	Prot.	Fat		
1	2	1	2	30	0.8
2	3	1.5	1.5	31.5	0.6
3	3	1	1.5	29.5	0.5
4	3	1.5	1	27	0.4

* Ketogenic-antiketogenic ratio

The quantity of insulin required varies from time to time. It depends particularly upon changes in activity and upon infections, and with less certainty, over a long period of time, upon body growth and possibly upon failure to maintain satisfactory glycemic equilibrium. The blood sugar of the diabetic child who is receiving insulin in appropriate amounts tends to be reduced when activity is increased. The converse of this occurs in the diabetic child whose blood sugar is excessively high; that is, the blood

sugar is raised to higher levels by exercise. This should not be taken to mean that diabetic children are to be inactive but that adjustments are to be made in the insulin dosage for both temporary and permanent changes in activity. The control of the child is simplified if the daily activity can be maintained at approximately the same level. When it is known that unusual activity will occur on certain occasions, the insulin dosage can be accordingly reduced. When the usual dose of insulin has been injected and the child indulges in excessive exercise, then he, his playmates and his family should be on the alert for evidence of shock, and sugar in one form or another should be available. Diabetic children should carry lumps of sugar in a small metal box at all times and should be instructed to take one lump at the earliest sign of shock. We have noted that it is generally necessary to increase the insulin dosage in the fall with the opening of school and that the dose must be decreased again in the spring after the school term is over.

Infection lowers the tolerance for carbohydrate and thus necessitates a temporary increase in the amount of insulin. This procedure is, as stated, only temporary and it will be necessary to decrease rapidly the amount injected after the child has recovered from the infection; otherwise he will have frequent hypoglycemic shocks. In general the procedure to be followed during severe acute infections is: (1) soft, easily digested diet; (2) carbohydrate maintained at essentially the level of the regular diet; (3) moderate decrease of protein; (4) marked decrease of fat; and (5) increase of insulin as necessary.

There is apparently no direct relationship between the requirement of insulin and increase in body size, although in some instances it is necessary to increase the dosage. However, there appears to be no consistency in the response of various children. In some instances, marked increase in dosage is required as the child increases in size, whereas in others only slightly larger doses are sufficient. Some children are maintained in glycemic balance without increase in insulin even though growth is proceeding normally. This is further evidence of the distinct need for individualization in the treatment of each child (2).

In recent years the attitude has developed among some clinicians that a greater efficiency in the use of insulin is obtained on a high carbohydrate diet than with a low carbohydrate intake. Some clinicians have believed that this is due to the lowering of the fat content while others have felt that the quantity of fat is not of great significance as long as the carbohydrate is maintained at a reasonably high level. We (3) have made careful observations of the blood and urinary sugar of a child while marked variations in the diet were made at certain intervals and at the same time the daily insulin dosage was maintained at the same level. The total daily caloric intake remained the same throughout the period of study; the amount of carbohydrate varied during different periods from 100 to 200 to 300 gm. and the fat was increased or decreased proportionately in order to maintain the same caloric level. The child was in satisfactory glycemic balance on a diet containing 200 C., 100 P., and 120 F. before the period of study.

No significant changes were noted in the level of the blood sugar or in the quantity of sugar excreted in the urine when the carbohydrate was reduced to 100 gm. per day. When the quantity of carbohydrate was increased to 300 gm. per day, there was some elevation of the average daily blood sugar level and a slight increase in urinary excretion of sugar, but in no sense in proportion to the increase in intake of carbohydrate. No attempt is made to explain the ability of this child to tolerate such marked changes in carbohydrate intake without the necessity of altering the insulin dosage. It may, of course, be concerned with the fat-carbohydrate relationship, but it seems doubtful that this is an entirely adequate explanation. The factor of initial stabilization and continued maintenance of glycemic equilibrium may be equally important.

Such data should not be interpreted as justification for free or unrestricted diets. It does, however, indicate that a fairly wide range in the qualitative and perhaps the quantitative intake of food is possible without a loss of tolerance. However, we feel that there are good reasons why, for the present at least, measured diets are advisable in the treatment of diabetic children. These reasons are: (1) control of the child's growth; (2) insurance of a balanced dietary intake; (3) instruction of the child and his family in the content of an adequate diet; (4) proportionate distribution of the diet throughout the day; and (5) the psychologic effect of aiding in training the child in self-discipline. It may be stated, however, that after a period of years it is probable that the young diabetic adult who has had his diabetic training as a child can satisfactorily estimate rather than measure his diet.

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NUTRITIONAL STANDARDS FOR THE SCHOOL LUNCH[1]

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IT HAS been said (1), "The adult physical pattern is the outcome of growth along lines determined by heredity but enhanced, dwarfed, warped or mutilated in its expression by the influence of environment in the adventures of life." Sherman (2), in commenting, suggests that nutrition, even in the stricter sense of the word—the everyday food supply—is often the dominant environmental influence; and that the unfortunate influences of an inadequate or unwisely chosen food supply with the resulting undernutrition or malnutrition are all too familiar. The fact that the control of food and other environmental factors can so markedly enhance the potentialities conferred by heredity is highly important and has been amply proved through animal experimentation. Nutrition is a science which has come into its own in the last thirty years. For centuries restricted diets have produced manifest disease but it is only recently that we have become aware of the fact that an inadequate diet exerts a profound influence in producing various borderline diseases, the symptoms of which are not always apparent. Failing health in the adult, particularly, may be the cumulative result of deficiencies in the diet covering a period of years.

McLester, in one of his excellent reviews (3), stresses the easily demonstrated fact "that vague ill health, the result of nutritive failure, is common and that the influence of suboptimal diets, particularly upon the nervous characteristics of the race, is not a negligible one." He further points out that "while susceptibility to infection cannot be increased by additions to an already abundant diet, resistance may certainly be greatly lowered by any deficiency."

It was only a short time ago that the distinction between minimum and optimum as applied to food was first recognized. Today it is becoming increasingly apparent that even the terms "adequate" and "optimum" are seldom synonymous. Repeatedly in animal experiments it has been found that by increasing the amount of a single factor in an apparently adequate diet, it is possible to enhance the animal's vigor and well-being.

This same fact is clearly demonstrated in the experimental study by Roberts (4) in which she has shown the effect of supplementation of milk in one study and banana in another upon the general health and development of children who supposedly were being well fed. The diets of these two groups certainly were not more deficient than those rather widely used in institutional feeding. The diets were apparently adequate but obviously, as such an experiment shows, not optimum.

A critical review, "The American Diet," has recently been written by Boyd (5). In spite of the available knowledge of food requirements which is disseminated through many channels,

[1] Read before the Conference of Food Service Directors, Rochester, New York, November 5, 1938.

he finds a prevalence of suboptimal states of nutrition. One must infer, he says, from the numerous studies in this field of investigation, that a large proportion of the people of this country are handicapping themselves through the inadequacy of their diets. The extent and significance of this status is not appreciated by the population at large nor by many of those concerned with the problems of health.

Qualitatively, nutritional needs are similar at all ages; quantitatively, they vary not only in total calories but also in the amount of individual constituents. The school lunch can play a definite part in the lives of the children who are either fortunate or unfortunate enough to have one-fourth of the weekly meals so supplied. During the period of growth, the food intake will exert its greatest influence. During this period the requirement for proteins and minerals (structural material) is both relatively and absolutely greater than in the adult.

Foodstuffs vary greatly in their content of nutritional essentials. No longer are foods considered valuable solely on the basis of their caloric content. We now consider them as divided into two major groups: those which are essential to body building and which are necessarily the main "protectors" of health; and those which are a source of fuel. It is the improper distribution between the two groups which brings about inadequacy. The White House Conference on Child Health concluded "that the alarming proportion of malnutrition existing among our school children is due not so much to poverty as to ignorance of dietary principles."

In outlining the dietary essentials, the optimal diet should be the objective—the one which will supply all of the food constituents in liberal amounts to assure an optimum state of nutrition—liberal amounts of essential food constituents and only an adequate caloric intake. The "abundant diet" is not the one which produces the greatest energy—contrary to popular opinion. Rather is it the diet, as McLester expresses it, "which both in sickness and in health will meet but not exceed the person's caloric needs. One which is designed to provide, as far as possible, an excess of today's calculated requirements of nutritive essentials—notably proteins and vitamins."

The concensus of authorities is that such a diet for a growing child should contain each day the following: 1 quart of milk; 1 egg; 2 or more liberal servings of vegetables, one of which should be of the pigmented variety, and one which can be eaten raw; 2 or more servings of fruit—one at least which should be fresh and eaten raw; a liberal amount of butter; fresh lean meat or fish, and liver once each week or more if desired; a cereal product—not too highly milled; and enough more food to meet the caloric requirement. Cod liver oil should be considered a food in the diet of the small child since its inclusion in the diet is necessary for an adequate vitamin D intake.

When departure must be made from such an outline, due to economic stress, it must be made with utmost care if food deficiencies are not to result.

The extensive treatise on the adequacy of diets at different levels of nutrition which has been prepared by Stiebeling (7) and issued by the United States Department of Agriculture, and

translated into the language of the layman by Hambidge (8), certainly should serve as a guide in any diet adjustment made necessary through budget curtailment. Undernutrition is extremely costly not only to the individual but to the nation as a whole.

It therefore becomes the duty of any one involved in the service of food to do his or her bit in nutrition education. No better place could be found than the school lunchroom where properly prepared, attractively served and adequately planned meals should be the rule. Here satisfactory substitutes may be made to meet price demands. Posters, exhibits, animal feeding experiments—all can contribute. Class room cooperation through use of health lessons such as those used in the Milwaukee schools certainly would be mutually advantageous. Pride in health should be made an incentive.

When one studies a summary chart (5) showing the theoretical caloric distribution between foodstuffs prescribed and the actual food consumed, as calculated from that observed in 224 typical American families by Sherman and in a federal survey, a surprising difference is found.

	PRESCRIBED	OBSERVED
Cereal products.....	20–25%	38–30%
Fats.....	13–14%	10–17%
Sugars and sweets.....	6–8%	10–12%
Egg, meat, cheese.....	7–8%	21–15%
Milk and its products..	34–38%	8–10%
Vegetables and fruits...	17–18%	12–15%

Unfortunately the table compares the needs of a 10-year-old child with the intake of food served both adults and children, but in general the important points are obvious.

The preponderant use of meat products in the observed dietaries compensates in an inadequate manner (except with regard to protein) for the deficiency of milk, and in a form which is economically extravagant.

The excessive use of cereals and sweets and the lessened consumption of vegetables in the observed dietaries is noteworthy.

Data regarding sugar consumption is incomplete since it does not take into account the consumption of candy and other sweetened products eaten apart from meals.

Unfortunately, the lower the income, the greater the increase in the cereal group with corresponding decreases in the other groups.

One of the obstacles in the improvement of dietaries is the ignorance and indifference as to body needs. School programs, university extension services which are free to all and so invaluable, and general health programs could remove this ignorance if the indifference did not exist. "People have become so accustomed to eating as a source of pleasure or as a means of silencing hunger that they do not recognize nutritional requirement beyond these ends."

Since this is true, it becomes the duty of the school lunchroom to shoulder more responsibility in this educational program by demonstration.

One finds from the food survey studies of Boyd in widely distributed areas and in large groups that while the milk consumption averages from .4 to 1.1 pints, in one individual sectional survey 40 per cent of the children received no milk at all. It is essential for the calcium intake of the child that more milk be used. If not in the home, then an

increased use of milk and milk products will be advantageous in the school where at least part of the children may have their requirements more nearly met. It has been shown that on 24 oz. of milk a day, a child may maintain a desirably positive calcium balance. Of course, increased use of milk has other advantages as well—calculating that a 10-year-old child needs 70 gm. of protein daily (1 gm. per lb. of body weight), a quart of milk will supply ½ this amount—the other half will be met by his meat, an egg, dish of cereal and bread. Hence, with a lessened milk intake, the protein level, too, may be inadequate. A quart of milk not only supplies the necessary grams of calcium in a readily usable form but phosphorus and large amounts of vitamins B_1 and B_2 as well.

The intake of eggs was found to be inadequate. The League of Nations' (6) report sets the minimum at .5 daily (3 eggs weekly). While in some states the minimum is exceeded, in others eggs are considered a luxury and very rarely eaten.

Marked regional differences were found in the habits of meat consumption. In the Kentucky survey it was found that 60 per cent was eaten as pork (bacon) which is an expensive source of protein. In general, while the meat intake of the adults is probably adequate, it is a question as to whether the relatively higher protein need of the child is met. Too often in restricted budgets too much dependence is put on the cereal sources of protein. While these, as supplementary protein, may be satisfactory, they usually result in a lowered mineral and vitamin intake. This danger is increased by our prevalent use of highly milled cereals. From these dietary studies, Boyd concludes "one would predict the prevalence of nutritional anemia and hypo-proteinemia among many of the inhabitants of the southern states."

This survey finds data on the total consumption of fruits and vegetables too meager for accurate information due to home production and consumption of these products.

The fats and sugars were found to be definitely increased. Whenever one or more foodstuffs usurp a major place in the diet, their use contributes to malnutrition.

Since the results of such a survey are generally applicable in all localities, it becomes evident that if good nutrition is to result, a counteracting influence must arise. Educational programs are, of course, in the long run most effective, but we do have an immediate method of attack—the planning of our school lunches in such a way that they will supply in as large a measure as possible those constituents which are so generally lacking. Can they not be planned to contain a maximum amount of the protective foods—and when price is an important factor, cannot that adjustment through substitution of cheaper foods be made on a more sound basis?

Such a survey as that which Boyd has summarized should be of far-reaching value. As Turner (9) expresses it: "The investigator advances knowledge. The interpreter advances progress. History affords abundant evidence that civilization has advanced in direct ratio to the efficiency with which the thought of the thinkers has been translated into the language of the workers ... This applies most aptly to our own field of

work. In no small degree, health, like civilization, advances in direct ratio to the efficiency with which the knowledge of the scientist is integrated into the practices of the people."

Shall we not demonstrate our realization of this need by planning meals which will conform as nearly as possible to the standard which we know is adequate in some instances, and in others where we can tentatively assume maintenance values. The more nearly school lunches can be planned to meet these requirements, especially for the protective foods, the greater assurance we have that the child's diet will be adequate. While waiting for parents to be educated, let us strive to protect the child's health through our own channels of work.

If we summarize the daily requirements for the child of school age, we may say: protein, 1 gm. per pound of body weight; calcium, 1 gm.; phosphorus, 1.5 gm.; and iron, 16 mg. These are the familiar Sherman standards.

In addition, we now tentatively calculate the vitamin requirements. Since the majority of the children eating in the school lunchroom are of late grammar or high school age, the value for adults would probably be most satisfactory.

Vitamin A, 7000 I.U.
" D, 700 " } 10:1 ratio

The vitamin B complex is now broken down and we consider the members of the B group separately.

Vitamin B_1, 300 I.U. or 1 mg. of thiamin

Vitamin B_2, 400 Sherman-Bourquin units or 2 mg. riboflavin

Vitamin C, 1200 I.U., 600 Sherman units, or 60 mg. ascorbic acid

Vitamin E need not be considered—nor need the other individual vitamin factors be separately considered. The values for nicotinic acid content of foods are just being accumulated. With adequate milk and liver, we can assume there is no deficiency of that factor of the B complex.

When one studies such charts as those prepared for the Department of Agriculture by the Bureau of Home Economics, the very striking effect of food deficiencies is manifest. Such extreme cases of deficiencies one sees rarely, but to a lesser degree they probably frequently exist and keep many children under par. Shall we not accept that challenge and all do our part in decreasing the number?

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THE UNIVERSITY CAFETERIA AS A MEANS OF IMPROVING THE DIETARY OF STUDENTS[1]

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BY THE time students have reached college age, it is rather difficult to change their dietary habits, but a study of the distribution of food expenditures shows that our students are selecting a diet that is better than that of the average American family. These studies, over a period of six years, indicate that our students as a whole select a well-balanced diet.

Improved habits of food selection developed as a result of our experiments with low cost diets. In 1932, due to the economic position of many students, we started serving low cost diets at a set weekly rate—$3.50 for three meals a day, excluding Sunday when the cafeteria is closed[2]. The group at first was restricted to 125, but later the low rate was available to any who wished to reduce their living expenses. This plan has been very successful and as a result this group now averages around 300 students each week. With the generally improved economic situation, students were not satisfied with the low cost diet so the price was raised to $4.00 per week, which permits a more varied and interesting menu. The breakfast menu consists of: fruit (oranges, canned grapefruit, tomato juice and a banana on each week's menu); a cereal; an egg once a week, usually soft-cooked or creamed on toast; toast, muffin or hot bread; jam or jelly with toast; and choice of beverage, including hot cocoa. Lunch is usually the 20¢ plate combination from the cafeteria menu but may be a soup and a salad, a hot bread or sandwiches, a dessert, and milk. At dinner the following is served: sometimes a beginning course such as fruit cup, soup, or a set-up salad; a meat dish (roast two or three times a week, and fish with or without choice of meat on Friday); potatoes and one other vegetable; bread; sometimes relishes; a dessert—pie usually twice a week; and choice of beverage.

The low cost diets proved so successful that we used the following priced meals to encourage other cafeteria patrons to choose a better balanced meal:

1. The 20¢ luncheon plate: a meat substitute or low cost meat dish with a salad or a vegetable; a relish or edible garnish; and a hot bread with butter. Popular combinations are: (a) scalloped sweet potatoes and pineapple with broiled bacon, creamed fresh green beans, raw carrot sticks, hot corn bread; (b) French-fried cheese sandwich, Canadian bacon, strawberry jam, and a fresh fruit salad.
2. The 30¢ vegetable plate: this is a very popular special and includes the choice of any three vegetables, rolls or bread, choice of dessert (cake, pie, puddings, fruits, etc.) and a beverage (milk, tea or coffee).
3. The 35¢ special: an inexpensive meat dish, any vegetable or salad on the

[1] Read before the Conference of Food Service Directors, Rochester, New York, November 5, 1938.

[2] Quast, Florence, and Strand, Helen: Feeding Students a Low Cost Diet in a University Cafeteria, J. Am. Dietet. A., 9: 36–40, May, 1933.

counter, rolls or bread, choice of dessert and beverage.

4. The 40¢ and 45¢ specials: choice of more expensive meat dishes, roasts, chops, steaks, chicken, etc., two vegetables or one vegetable and a salad, rolls or bread, dessert and a beverage.

Salad dressings are in bowls and the customers serve themselves. Second helpings are allowed on coffee and cocoa for the low cost diets.

A good quality of food, well-cooked, served at the proper temperature and so planned and displayed as to provide eye appeal, is the second method. The slogan is, "Every plate an attractive picture." All the cooks are women, trained in our own kitchens. They are above average for institution employees and have a professional interest in their work. They are encouraged to make suggestions, and compliments on the food and service from customers are passed back to the kitchen employees.

Vegetables are one of our specialties and there is always one bright green and one good red or orange colored vegetable on our counter. We use vegetables in their fresh form whenever these are available and a good quality of canned vegetables when necessary. They are cooked only in small quantities, as needed on the steam table. After a vacation so many vegetable plates are selected that the cooks say the students are on a "vegetable jag." Our students prefer their vegetables cooked to the tender stage—just past the "almost underdone point." Faculty members, however, sometimes object, as did one faculty wife who jabbed the stem-end of a cauliflower head with her fork and turning to her husband said, "Do not take it, dear. It is all raw and will give you indigestion."

Variety on the menu is important when the group eat most of their meals in one place. We have compiled our own menu suggestion book and records are kept of popular and attractive combinations. Garnishes and accompaniments are varied, and the traditional sauces are not always used. Sautéd fruits, such as half of a broiled peach with mint or currant jelly, or puffy raisins in the hollow of the peach, sell inexpensive meat dishes. Tops of baked dishes are garnished with melted cheese, bacon cubes, lightly cooked green and red pepper, or a few green, freshly cooked, frozen peas. To introduce a new dish or to sell a less expensive one, we use combinations. A few bright green peas in a nest of mashed squash sells the dish rapidly, when plain mashed squash would not appeal to as many people.

The third method used to encourage selection of a balanced diet, is to gain the confidence and good-will of the students. The ways are varied.

1. Students on the low cost diet are given special instruction sheets explaining the value of certain foods in their diet. In this way they are encouraged to increase the iron content by selecting at least two slices of whole wheat bread each day. The sheet explains why only milk is provided as a luncheon beverage and why they should avail themselves of the opportunity of drinking it three times a day. Private conferences are arranged with students who habitually make poor selections, or who have food prejudices. Hearty box lunches are furnished instead of the served lunch for field trips.
2. Because of dietary disorders, several

students are on special diet. There are cases of stomach ulcers, colitis, skin eruptions and various temporary ailments. These students could not remain in college if we did not provide for their special needs. One colitis patient who was losing weight has gained fifteen pounds in a year and a half.

3. Special occasions are observed with special menus and all the trimmings. Cider and doughnuts are provided for Hallowe'en. At Christmas time, several large trees are set up in the cafeteria and the dinner patrons help to decorate them.

Comparison of Distribution of Foodstuffs on a Low Cost Dietary as Compared with the Normal Requirement—Calculated from a week's menus in May 1937

*Normal Requirements**	*Syracuse University Low Cost Diets—Daily average per week*
Carb.—50–60% of total calories per day	46.5%
Prot.—10–15% of total calories per day	12.3%
Fat—30–40% of total calories per day	41.2%
Iron—.012 gm. per day	.014 gm.
Calcium—.68 gm. per day	1.429 gm.
Phosphorus—1.32 gm. per day	1.99 gm.
Calories—around 3000	2996 calories
Vitamins—Chief sources: milk, eggs, meat, animal fats, whole grains, fresh fruits and vegetables	
Water—6–8 glasses per day	
Food expenditure for low cost diet	
Average daily food cost per person	.447
Total food cost per person for the week	2.679
Food percentage	.67

* Source of figures for normal requirements—Sherman, H. C.: *Chemistry of Food and Nutrition.*

Expenditures for the month for entire cafeteria:

Food	56%
Labor and supervision	29%
Rent	3%
Maintenance and replacements	10%
Laundry	2%

Distribution of Food Expenditures, College Commons, 1935–36

PERCENTAGE OF MONEY SPENT	STANDARD FOR ADULTS PERCENTAGE†	COLLEGE COMMONS (ENTIRE CAFETERIA) PERCENTAGE	LOW COST DIETS PERCENTAGE
I. Fruits and vegetables (includes fresh, canned and dried)	25	24.4	25.5
II. Meats, fish, poultry and eggs	20–25	24.0	22
III. Milk, cream and ice cream	25–30	21.1	25.5
IV. Butter, salad oils, cooking fats		10.6	7.85
V. Cereals, sugars, sweets (includes all breakfast cereals, flour, bread, macaroni, spaghetti, preserves, jams, jellies, candy, syrups)	15	15.6	16
VI. Miscellaneous (includes pickles, olives, tea, coffee, cocoa, chocolate, salt, spice, flavorings, etc.)		4.3	3.15

† Sherman's *Chemistry of Food and Nutrition:* "Whatever the level of expenditure (1) at least as much should be spent for milk (including cream and cheese) as for meats, poultry, and fish; and (2) at least as much should be spent for fruits and vegetables as for meats, poultry, and fish."

4. We try to create a friendly atmosphere in the dining room. Our student employees are very loyal and help to spread the feeling of good will. An effort is made to have fresh flowers on the tables. At dinner, half of the dining room is lighted by candles. It is interesting to see how the tables in the candle-lighted end are filled up first. A large bashful looking boy, on being congratulated by a friend because he had secured a good job providing board off the campus said, "Yes, I am fortunate, but I miss the Commons. They have candle-light at night and it is so romantic."

This service has been successful not only from the standpoint of student satisfaction and well-being, but also from the financial side. Increased patronage has made possible economies in food purchasing and with increased income, the percentages of expenditure necessary for overhead, labor, supervision, etc., have decreased, allowing an increase in the amount of money available for food expenditures.

EDITORIAL

Vitamin and Mineral Concentrates In Dietary Practice

The period of wonderment regarding vitamins has now given way to one of great familiarity. The marvels of the vitamin alphabet have caught and held the popular fancy and made all aware of the import of sound nutrition. Now that they have served their purpose, these alphabetical designations for food factors, once obscure, in turn must give way to a new vitamin nomenclature in which each factor now chemically identified may be more accurately designated according to its chemical structure. We are already aware of the enormous effects in the physiological economy[1] that may be accomplished by extremely small quantities of these substances. And with more exact chemical assays, in contrast to biological, the vitamin values of foods and the human requirements for the various factors will be determined with greater ease and accuracy.

It has recently been said[2] that more progress has been made in the science of nutrition since 1915 than in all time previous. The demonstration of the existence of the vitamins and their function has been the chief determinant of this progress. But what of the practical application of this research in the fields of public health and the prevention of disease? Murlin has said that the physician relies upon the dietitian to tell him which foods contain the vitamins. In other words, like the pharmacologist who fills the drug prescription, the dietitian is expected to fill food prescriptions that will meet the varying needs of the individual in health and disease. Thus she must know not only the vitamin, mineral and other values of foods but the human requirements for these. Unlike the drug prescription, this food prescription is not always stated by the physician in complete detail. It may be solely in terms of total calories or in grams of carbohydrate, protein and fat; or as high-vitamin, bland, or low-residue, milk-free or wheat-free. At times the dietitian's ingenuity may be taxed. The foods themselves, under the demands of caloric restrictions, as for example in the recently reported study[3] of the adequacy of the 1000-calorie diet, may not readily meet the standards for minimal to say nothing of optimal adequacy with regard to vitamins, if not minerals. And what of the patient allergic or resistant to milk and its products? How may we then meet the calcium needs?

The answer is the dietitian cannot readily meet the requirements of optimal adequacy in many instances without the aid of vitamin and mineral concentrates or the use of foods fortified with these. Should she then be sufficiently informed regarding such products so that she may suggest the need for their supplementary use to the physician? Or should she, ordinary foods having failed to meet the situation, resign in favor of the pharmacologist? In other words, when do vitamins and minerals cease to be foods and become drugs? Such a poser might

[1] Murlin, J. R.: J. Am. Dietet. A., 14: 397, 1938.

[2] Simmonds, N.: J. A. M. A. 111: 1073, 1938.

[3] Martin, E. W.: J. Am. Dietet. A., 15: 33, 1939.

be as crushing as the old query, which comes first, the hen or the egg, were the dictionary not available. An authoritative definition of food is "anything which, taken into the body, serves to nourish or build up the tissues or to supply heat".[4] A drug, by the same authority, is "any crude medicinal substance" and medicinal connotes "healing qualities" and relates to a process of cure or the restoration of wounded parts. A less narrow definition of food than that given above appears in the latest, unabridged edition of *Webster's International Dictionary* as: "nutritive material absorbed or taken into the body of an organism which serves for purposes of growth, work or repair and for the maintenance of the vital processes". Clearly, vitamins and minerals, whether in ordinary foods or as concentrates, come more nearly within the definition of food, and as such are distinctly the concern of the dietitian. Foods are like drugs in one respect—both are adjuncts to the physician in his practice of the healing art.

The current and indiscriminate use of "shot-gun" vitamin therapy without due regard to the interrelationships of the various vitamins, minerals and other food substances, is likely to be but a transient phase which probably will go the way of other temporarily fashionable cure-all systems.

Elvehjem,[5] in a recent address before the American Dietetic Association said: "what is the dietitian to do about synthetic vitamins? They are here; what stand are you going to take? The clinician is finding them valuable in many instances and surely you will want to make the proper use of them. In doing so we must not lose sight of the joy of consuming natural, nutritious food". He continued, "If our natural foods need supplementation with synthetic products should they be supplied through the grocery store or the drug store?" Some may prefer, as he said, to consume their daily supply of thiamin in the form of a pork chop, their riboflavin as a glass or two of milk, and their nicotinic acid as a small piece of liver. However, as Elvehjem has said, this does not mean that certain foods should not be fortified with some of the above compounds under specific conditions. Whether or not certain foods should be supplemented with these compounds, according to Elvehjem, "is a problem for our dietitians to consider".

The adequately trained dietitian, ever aware of the fundamental requirements for good nutrition, will not be likely to look upon vitamin capsules and mineral concentrates as panaceas for the solution of all nutrition problems, valuable as they may be in supplementing certain diets. She realizes, like Simmonds, that the "spectacular relief of the outstanding symptoms of pellagra by nicotinic acid or of scurvy by ascorbic acid does not solve the nutrition problems of patients with these diseases", for it is the dietitian who has been largely responsible for the fixing of diet therapy upon the firm foundation of normal nutrition. If she is to assist the physician intelligently she should be fully informed regarding the use of vitamin and mineral concentrates as supplements to a diet when certain foods are disliked or their use contraindicated. As a

[4] The American Medical Dictionary, 18th ed. 1938.

[5] Elvehjem, C. A.: J. Am. Dietet. A., 15: 6, 1939.

specialist in food it is her job to know what they *do not* contain as well as what they *do* contain.

Diet in Relation to Oral Health

There are two prevailing concepts with regard to the etiology of dental caries: (1) is caries caused primarily by nutritional errors or metabolic disturbances that influence the tooth from within; or (2) is the environment of the tooth in the mouth the controlling factor in the causation of this disease? Koehne[1] thus examines the situation and reasons if the latter concept is correct, how does diet influence this environment?

She states that no one today questions the fundamental importance of a nutritionally adequate diet from birth until the crowns of the third permanent molars are formed. The formation of sound teeth and parodontal tissues and of jaw bones permitting normal occlusion, as well as sound deciduous teeth, all are dependent upon good nutrition. With regard to the component parts of the diet, the desired normal calcium and phosphorus metabolism may be interrupted during illness or in acute or chronic conditions when absorption of the nutritive constituents, including minerals, may be faulty. Vitamin D, as a supplement to the mineral constituents, is as advantageous to good dentition as it is for rickets prevention. The situation with regard to vitamins A and C is not so clear-cut as that concerning vitamin D. The results of Hess and Abramson[2] are cited which indicate that infantile scurvy has not been shown clinically to have any effect on the permanent teeth nor even to delay tooth eruption. Deficiency of vitamin A, according to Bloch,[3] has no specifically injurious effect on formation or calcification of the teeth.

Is the tooth after eruption subject to metabolic changes from within? It is believed by a number of investigators that the ability to form a protective layer of secondary dentin when a tooth is injured from without, is continuously dependent upon nutritional factors that govern the original calcification of the teeth. These factors are calcium, phosphorus and vitamin D.

An unhealthy condition of the parodontal tissues may be due to failure to use the teeth in chewing and to a variety of other causes. Scurvy at any time of life is associated with edematous and hemorrhagic conditions of the gums, active disintegration of the jaw bones and resultant loosening of the teeth. Decalcification of bones in scurvy is due not to faulty calcium and phosphorus metabolism, but to failure to maintain the cement-like mortar that holds the mineral cells in place. Administration of vitamin C restores these conditions to normal.

The susceptibility to caries, however, apparently bears little relation to the degree of structural perfection of tooth enamel. Many persons with seemingly no structural defects in the enamel are susceptible to tooth decay. Is there any direct relationship between nutrition and metabolic processes and caries susceptibility? Many conflicting theories have been advanced as to this relationship. Koehne lists prevailing ideas as to these preventives, correctives or causes

[1] Koehne, Martha: J. Am. Dent. A. and Dent. Cosmos, 25: 1767–80, 1938.

[2] Hess, A. F., and Abramson, H.: Dent. Cosmos, 73: 849, 1931.

[3] Bloch, C. E.: Am. J. Dis. Child, 42: 263, 1931.

as follows: (1) the nutritional completeness of the diet; (2) the use of vitamin D especially while the teeth are being formed; (3) either the intake or the metabolism of calcium and phosphorus is related to caries susceptibility; (4) the cause of dental caries centers in the acid neutralizing power of blood and saliva.

In summary, Koehne concludes that while the nutritional adequacy or inadequacy of the diet may be a factor in determining the rate of progress of caries, it is probably not its primary etiologic agent. Saliva may contain a factor or factors that minimize the effect of acid formed on the tooth surface, but the nature of this factor is not yet known. She points to the theory that food intake affects the integrity of the erupted tooth chiefly through making conditions possible or impossible for aciduric microorganisms to infest the mouth and produce acid on protected tooth surfaces. She states this to be the only logical explanation for many known facts about the occurrence and unusual nature of the disease. The nature of the true immunity to caries possessed by some is not yet known, and doubtless is an inherited characteristic. This immunity inhibits the growth of certain aciduric microorganisms in the body.

That the nutritional adequacy of the diet is of fundamental importance from the prenatal period through adolescence, in the formation of a sound healthy body and well-formed, well-enameled teeth with satisfactory occlusion, is generally accepted. Such a diet is equally important throughout life in the maintenance of the general health and the health of the parodontal tissues. If at the same time "the use of concentrated sweets is reduced to an absolute minimum, there is the greatest likelihood that the incidence of caries in the civilized world will be reduced to the minimum."

Dietetics and the Dietitian in Great Britain

At a luncheon meeting of state presidents of associations affiliated with the American Dietetic Association, at the annual meeting in Milwaukee, Margery Abrahams of St. Bartholomew's Hospital, London, told of the marked progress made in the last thirteen years among dietitians and nutritionists in Great Britain. Many of those who did pioneer work in England received their early training in the United States. Among these was Rose Simmonds who in 1925 began her work as dietitian at the London Hospital. Later, she was called upon for assistance during the first serious illness of King George V in 1935, and as Miss Abrahams remarked, this was "probably the first time that a monarch's recovery was materially assisted by one of our profession."

Soon after the appointment of Miss Simmonds to the London Hospital, Miss Pybus began her work at the Edinburgh Royal Infirmary. Gradually other openings developed, first in hospitals and then in the wider field of public health. Today, Margaret Broatch, a prominent member of the British association, is responsible for the school feeding of children under the London County Council with a school roll of about 400,000 children. Edna Langley has an even wider scope of work since she supervises school meals all over England under the national Board of Education.

The first dietitian to be attached to the public health department of a county was Miss Sewell in the county of Somerset. In South Wales, Mrs. Sessions, the former Miss Hilton and an American trained Welsh-Canadian, directs work among the women of the unemployed. Similar work is also done in the northern, and what the British term, "distressed" areas. Dietitians, as well, are taking part in the various surveys of food consumption in Great Britain, some working under the Ministry of Health, directly, and others under Sir John Orr of the Rowett Institute in Aberdeen. Two dietitians, according to Miss Abrahams, have recently gone to Nyasaland under the Colonial Office and the Medical Research Council to conduct an investigation of the food habits of the native peoples there. It is hoped that this work will be of the greatest value in guiding the authorities as to health measures, the planning of agricultural production and the inclusion of "protective foods" in imported commodities.

The British Dietetic Association has had special problems to consider in regard to educational qualifications for dietitians entering institutions and other fields. The possibilities in the field of dietetics early attracted women of widely different training, all of whose contributions at the time were far too important to overlook. Some were state registered nurses; others were home economics teachers who lacked university degrees and still others were graduates in pure science who had had no home economics training. Today, two universities grant degrees in home economics (or domestic science as it is still termed in England): London University at King's College of Household and Social Science, and Bristol University. Graduates from these colleges go directly into hospital dietary departments, but according to Miss Abrahams they are urged to take preliminary postgraduate training. Such training in the London University leads to a diploma in dietetics and includes six months of university work in chemistry, physiology, nutrition, etc., followed by six months in a hospital diet kitchen and six weeks in a main kitchen. This course, as well, is suited to the pure science graduates who have majored in chemistry and physiology and who are expected to take a three months' intensive course in cookery before the academic part of their studies begins.

There are two postgraduate courses in Scotland which are especially suited to the needs of nurses and teachers of home economics. One at the Edinburgh Royal Infirmary covers eighteen months and permits special cookery courses for nurses, and nursing experience for home economics graduates, as well as instruction in chemistry and physiology and six months of diet kitchen work. The Glasgow and West of Scotland College of Domestic Science offers a year's course leading to a diploma, followed by six months' hospital training, all of which is especially suited to pure science and home economics graduates.

Thus it appears that British students need no longer come to America for their dietetic training. Many, however, look forward eagerly to a period of observation in American dietary departments and such experience is regarded highly by those who employ dietitians in Great Britain. Today the British Dietetic Association, while numerically small compared with the American Dietetic Association, has members all over Eng-

land, Scotland and Wales, and a special branch is being formed by colleagues in Scotland. Founded in 1935 and therefore but three years old as compared with the American association's twenty-one years, the British Dietetic Association, judged by its present rate of progress, promises to match the older association's present attainments, both in professional developments and we hope in membership growth, long before it reaches its majority in 1956.

CURRENT COMMENT

Vitamin Content as Affected by Cooking and Canning

Some of the early work on the chemical nature and properties of the vitamins showed that while all are to some extent heat-labile they all differ widely one from another with regard to the conditions which influence their rate of destruction. With this in mind, Fixsen[1] believes that it is highly important to know as accurately as possible the extent of loss of vitamin content likely to be undergone during the processes of cooking and canning. Unless due allowance is made for such losses during cooking, the resultant calculations may be far from correct. She refers to a report of the Medical Research Council in which mention is made of two instances where outbreaks of scurvy occurred on diets containing sufficient vegetables of high antiscorbutic potency, which would have been more than adequate had the vegetables been cooked in a satisfactory way. The vegetables had been included in large quantity meat stews and cooked for at least five hours or a period sufficient to destroy nearly all the vitamin C content. Such a procedure has been very common in certain institution kitchens unsupervised by competent dietitians.

The wide variability between the vitamin contents of different samples of foodstuffs is further complicated by the many other variables introduced by processes of cooking. Method of preparation, rate at which cooking takes place, the point at which it stops, the amount of water used in cooking and many other details are all points of importance in determining the probable extent of vitamin loss.

Tables have been compiled which contain selected determinations of the vitamin content of cooked and canned foodstuffs. Fixsen believes that these values should not be used to calculate the vitamin content of a diet containing cooked materials. Instead, the vitamin content of the raw materials should be calculated and then due allowance made for the losses incurred in cooking. She hopes that the tables will be of service in suggesting the allowances that should be made. She considers the effects of processes used in cooking and canning separately for the vitamins A, B_1, B_2 complex, C and D, and adds that results suitable for tabulation are only available for vitamins A, B_1 and C. The seemingly disproportionate space devoted to vitamin C is partly due to the fact that this vitamin is much more sensitive to

[1] Fixsen, Margaret A. Boas: The vitamin content of human foods as affected by processes of cooking and canning (with tables), Nutrition Abst. & Rev. 8: 10, October 1938. Price 2 s. each copy, post-free, upon application to the Secretary, Rowett Institute, Bucksburn, Aberdeen, Scotland.

heat and oxidation than the other vitamins and therefore the preparation and cooking of foods valued for vitamin C is a problem of real importance. The large bulk of results relative to vitamin C is due to a technical reason—it is the only vitamin for which comparatively easy chemical methods of estimation have been devised.

Food Clinic Training and the Student Dietitian

Dietetics, like almost every profession, is becoming more and more specialized, and the division into therapeutic and administrative dietetics grows increasingly marked. So valuable is the food clinic experience for the therapeutic dietitian that without it one can scarcely consider a student course adequate. Here the student receives her training in applied dietetics. Here she learns the "social approach" to the field of nutrition. She also learns how she may later serve and assist the medical profession as consulting dietitian. She is enabled to assist in some small measure in improving the general health of the patients, all of which instils in her a pride in her chosen profession.

Most outstanding of the benefits of such experience for the student is the training she receives in the practical application of dietetics. The fulfilment of the doctor's diet prescription for a hospitalized patient, where there is a stabilized routine and suitable facilities, is relatively simple when compared with the obstacles in the way of carrying out a dispensary patient's diet order. John Jones, for instance, who rents a single room, drives a truck and is in the habit of buying his meals at various roadside stands en route, has been ordered on a convalescent ulcer diet. How best to instruct and advise him as to the type of food he should select with the inclusion at the same time of all the dietary essentials, is a typical problem to be solved by the dietitian. Another, a little girl, is allergic to milk, wheat and eggs. Unfortunately, her parents are extremely poor and almost illiterate. Charles is a Jewish lad with diabetes. So his diet must be adapted to his racial food customs and a suitable lunch planned for him to take to school. An Italian mother is able to converse only through the medium of her small son who acts as interpreter, so a great deal of time is required for her diabetic instruction. By the use of food models, pictures and other materials available in the food clinic, she is able to understand something of the nature of her disease and how to follow her diet. Thus, in the food clinic one links the diet problem with the individual, while in the hospital one must guard against the tendency to think of the patient as just another "special diet". The student sees that the special diet meals of a hospitalized patient should be representative of those he should have after discharge, and should therefore be modified to suit the patient's means and comprehension.

Because there are a good many problems to be solved each day, the student dietitian develops a working knowledge of therapeutic dietetics which she has at her finger tips. In studying the histories of her patients, the student may be better informed concerning the clinical symptoms of the diseases for which diets have been ordered. She also has an opportunity to increase her medical vocabulary and learns to interpret the results of clinical and laboratory tests.

Many of the services of the food clinic are closely allied with those of the social service department of the hospital. Because financial difficulties occur so frequently among the patients with whom she deals, the dietitian obtains experience in planning adequate low-cost dietaries and giving advice in economical shopping and food preparation. Moreover, through her connection with relief cases, she becomes acquainted with the various welfare and relief organizations in her community and may be called upon to assist in their work. The environmental factors which contribute to effective dietary treatment frequently need adjustment. Perhaps the day's routine may need revision to allow for more rest and recreation; or encouragement and sympathy may be all that is necessary to bring about a brighter mental outlook. Through individual and group instruction, in the diabetic, prenatal and dental clinics, for example, she develops the ability to interest and convince her patients as to the necessity for proper nutrition. Much can be learned concerning the food habits and customs of various races and classes, and an appreciation of how resistant to change are the dietary habits and traditions of a people. The majority of the patients the dietitian sees in the clinic are of the same class as many of the employees with whom she deals elsewhere in the hospital. Because of a more intimate knowledge of their life and habits the student obtains a background for the psychology of personnel management.

The food clinic dietitian may be of service to the doctor in the out-patient department in many ways. Evidence of this is the number of clinics from which patients are referred—diabetic, cardiac, medical, orthopedic, obstetric, gastro-intestinal, pediatric, dental, and even the psychiatric. Because of her experience as a student she can give help and instruction later concerning the use and practical application of diets to medical students and others.

The food clinic, therefore, provides many varied and unique experiences and its training value to the student dietitian is, indeed, indispensable.—KATHLEEN DENNE, *Student Dietitian, Johns Hopkins Hospital, Baltimore.*

NUTRITION INSTRUCTION IN A Y. W. C. A.

In November 1937, the Detroit Young Women's Christian Association asked the Detroit Dietetic Association for assistance in conducting one of its classes, the members of which had requested information on methods of both gaining and losing weight. In response to this request one of the members, Sarah Whittinghill of the Children's Hospital, Farmington, Michigan, began a series of lectures at the association headquarters. She approached the subject from the standpoint of normal nutrition with modifications for both weight gain and weight loss. The lectures were informal, and were followed by open discussion and later replaced by a system of short personal interviews attended by those who wished to discuss their own individual dietary problems.

The majority of the women who came for nutrition counseling were of one of two groups. Some were housewives, most of whom had a good sense of food values, and were interested primarily in instruction supplementing the nutrition knowledge which they had previously acquired. The second group consisted

of young business women who were particularly interested in corrective diets for constipation, acne, overweight, underweight, fatigue, and insomnia. This group asked many questions regarding fad diets.

Of those attending the series, 144 took advantage of the personal interviews and nutrition counseling during the three months this service was maintained. The interviews averaged approximately fifteen minutes each.

In reviewing the year's program in nutrition counseling and the results obtained, one can readily see certain modifications which should be considered in any future program in this field of work. In the first place, more publicity should be given to the program prior to the beginning of the counseling service. A series of from four to six informal lectures followed by open discussions should precede the individual interviews and the groups should be somewhat smaller than in the past. More time should be given to each individual at the time of the first consultation, and more complete records should be kept.

The members of the Detroit Dietetic Association who took an active part in the 1937–1938 program of nutrition counseling at the Detroit Young Women's Christian Association were: Sarah Whittinghill, Children's Hospital, Farmington, Michigan; Gertrude Stone, City Physician's Office; Enid E. Booth, formerly of Wyandotte General Hospital; Verna J. Smith, formerly of Evangelical Deaconess Hospital; and Helen Shaw, North End Clinic, Detroit.

Teaching Cookery to Mexican Girls

The postgraduate course for dietitians at the Ancker Hospital includes affiliation with the Family Nursing Service of St. Paul, Minnesota. The student dietitians remain with this organization for six weeks. During this period they attend classes, clinics, visit homes and aid families in planning the expenditure of money for food.

At the request of the director of the Family Nursing Service, a cooking class for Mexican girls was organized at the Christ Child Community House in St. Paul in December 1937. The ages of the girls ranged from thirteen to seventeen. Six girls were enrolled in the class which later increased to twelve. These classes have been taught weekly by the different student dietitians as they worked with the Family Nursing Service. Sessions were held on Thursdays from 3:15 until 5:00 p.m. after the regular school classes were dismissed. The space and equipment were inadequate but the results were gratifying in spite of these handicaps. Equipment included one large gas range, work-table, sink, four cupboards with work-tables, and the usual cooking utensils, very limited in number.

The first item to be stressed was cleanliness in the handling of food. Considerable emphasis was placed on cleanliness of dishes, proper method of setting a table, and table etiquette. Variety in preparation and serving of foods was also emphasized as the Mexican girls were familiar only with the preparation and serving of the routine Mexican dietary.

Simple, low-cost recipes and foods were used. Other lessons were devoted to egg, vegetable, milk, and cheese dishes, followed later by the preparation of inexpensive meals.

The County Welfare Board of St. Paul issues a food list each month and

families receiving aid may purchase only the items from this list; therefore only foods appearing on the food list were used in the classes. The last few lessons were devoted to preparing and serving low-cost meals, and after discussion and criticism of the food, the girls served the food as their evening meal. In one class period a picnic lunch was prepared. At each session the students were given a copy of the menu and recipes, to be taken home for further experimentation. The teaching was excellent experience for the student dietitians as well as beneficial to the young Mexican girls. The Family Nursing Service was pleased with the results and the student dietitians commended on their work.—JOAN M. DURNAN, *Student Dietitian, Ancker Hospital, St. Paul, Minn.*

BOOK REVIEWS

The Foundations of Nutrition. By Mary Swartz Rose, Professor of Nutrition, Teachers College, Columbia University. Third edition. New York: The Macmillan Company, 1938, pp. 625. Price $3.50.

In this third edition the researches of recent years have but served to establish more firmly the foundations of nutrition as originally outlined in the first edition of this book in 1927. The new advances in nutrition have given a better understanding of human requirements and shown how to use common food materials to better advantage. Since the second edition was published in 1933, the chemical identification of the vitamins has made marked advances. With the use of highly concentrated preparations or the pure crystals of the vitamin substance itself and with the more complete assays of food for vitamin values, an entire revision of tables and dietaries has been necessary. The chapters on the vitamins clarify and give point to our present knowledge and its practical application. The use of many new illustrations, some of which are in color, add to the interest of the current edition.

This present edition, like its predecessors and other writings of Mrs. Rose, is characterized by a pleasing and animated literary style. As always the author shows a fine sense of scientific discrimination and a seasoned judgment that bespeaks the good teacher. Her book is a thorough and dramatic portrayal of a subject that has advanced from early empiricism to a position firmly entrenched in established scientific facts.

Nutrition and Diet Therapy: A Textbook of Dietetics. By Fairfax T. Proudfit, Instructor in Nutrition and Diet Therapy, University of Tennessee College of Medicine, Memphis. Seventh edition. New York: The Macmillan Company, 1938, pp. 923. Price $3.00.

Miss Proudfit, in the seventh edition of her well-known text, has revised the book to follow the unit plan of teaching nutrition as outlined in the recently published *Curriculum Guide for Schools of Nursing*. Section I covers normal nutrition for the adult and for the child and includes diets in pregnancy and lactation. This section also contains chapters on meal planning, food cost, and foods of the foreign-born. Section II deals with laboratory outlines, foods, suggestions for demonstration, and key recipes. Section IV furnishes further recipes. Section III deals with diet therapy, each unit followed by suggestions and recipes for laboratory periods. An appendix contains tables, examination questions, a reading list, an index of recipes and a general index.

The narrative material reads easily, as the style is clear and direct. Each chapter is followed by a summary, and in addition a general summary follows the diet therapy section. Unfortunately the chapter on diet in diseases of children, present in the earlier editions, has been omitted. This material is now included, where pertinent, in the individual chapters on diet in disease. Tables and illustrations are scattered plentifully throughout the book.

The problem which today confronts the author of a nutrition text for nurses is that she must of necessity include a great variety of material within the covers of a single book. Some understanding of the fields of digestion, metabolism, nutrition, diet therapy, food cost and cookery is expected of the nurse today. Miss Proudfit has covered these subjects thoroughly, with a liberal use of visual material. The student and graduate nurse, and certainly the medical student and the student of home economics, will find the book an excellent reference. It seems to this reviewer, however, that the book is rather too detailed to be easily used as a text by the student nurse.—HENDERIKA J. RYNBERGEN, *Instructor in Nutrition, The New York Hospital School of Nursing, New York City.*

The Chemical Analyses of Foods and Food Products. By Morris B. Jacobs. New York: Van Nostrand, 1938, pp. 487. Price $6.00.

To the food chemist or to any one engaged in the chemical analysis of foods and food products, this volume of procedure with descriptive information will prove a reliable guide and reference book.

The author has attempted to present short, practical, usable methods of routine control work and has evaluated the various technics in use and supplemented them with critical discussion of the newer aspects of analysis that are difficult for the average worker to find in most

textbooks. Its use will enable the food chemist to detect adulterations of the common food products.

The opening chapters deal with definitions of terms, explanatory notes as to procedure, and general historical information in regard to the development of chemical analysis of food and the governmental regulation of adulteration and misbranding. These are followed by chapters on preparation of reagents, equipment, and chemical and physico-chemical methods.

From his own experience as chemist of the Bureau of Foods and Drugs, Department of Health, City of New York, Mr. Jacobs is in a position to discuss means of detection of the various preservatives used harmlessly or to conceal damaged or inferior foodstuffs, such as coloring matter, metals and other adulterants. In the chapter on milk and cream, he treats of pasteurization and improperly pasteurized milk, a subject evidently much before the public just now. The Massachusetts Department of Health has recently issued a pamphlet devoted to milk with articles on the progress of milk regulation, the grading of milk, and the pasteurization of milk. In England the National Institute for Research in Dairying has issued two pamphlets, one on the effect of commercial pasteurization on the nutritive value of milk as determined by laboratory experiments.

In the book under review, detailed methods are applied to the analysis of butter, cheeses, vitamin D milk, evaporated, sweetened condensed, dried and fermented milks, ice cream, sherbet, ices and dried milk products. Chapters deal with composition of oils and fats, their analysis and detection of adulterants and preservatives; sugars including honey and confections; gums; cereals and other starches; jams; jellies and fruit products; spices, flavors and condiments. There is a chapter on non-alcoholic soft drinks, coffee, tea and chocolate products with definitions and standard analysis of the various types and methods used to detect falsification, followed by one on alcoholic beverages because the food analyst must be able to detect adulteration and because of the many regulations governing their manufacture.

Protein products such as meats and "prepared meats", fish, and eggs, include tables of analyses and definitions of terms as well as procedures to detect binders and other substitutes. A chapter is devoted to vitamins and their classification (not quite so up-to-date as a 1938 edition of a textbook should be) with methods for chemical versus biological assays.

The book is well interspersed with illustrations of modern apparatus and tables in the text and appendix.

Nutrition: The Newer Diagnostic Methods. Proceedings of the Round Table on Nutrition and Public Health: Sixteenth Annual Conference of the Milbank Memorial Fund, March 29–31, 1938. New York: Milbank Memorial Fund, pp. 192.

This volume is an account of a round table conference on nutrition held under the auspices of the Milbank Memorial Fund. Nutrition is a bodily process; therefore detection of any derangement, with its symptoms, signs, and underlying pathology, constitutes a medical problem. The need for objective methods of diagnosing the "invisible zone" in nutritional conditions has become more pressing than ever.

The book comprises the contributions of several authorities which detail the more sensitive means of determining primary states of deficiency. Dr. T. Wingate Todd discusses the use of roentgenology in assessing the nutritional state and in detecting certain deficiency diseases. He introduces the problem "on that debatable ground which slopes gently downward from the sun-warmed peak of health." He urges the use of roentgenology in detecting the early signs of deviation from normal structure so that one may then assess the disturbance of health before that disturbance becomes pronounced enough to give clear-cut evidence of disease.

Dr. Selig Hecht discusses dark adaptation and the diagnosis of avitaminosis A. He suggests that with care dark adaptation may be used as an aid in the diagnosis not only of avitaminosis A produced by a lack in the diet, but by a failure of some organ in the path of the flow of vitamin A from the diet to the retina.

Dr. Jacob B. Feldman discusses the use of the photometer in detecting latent avitaminosis A; Dr. Soma Weiss shows the application of electrocardiography in the detection of avitaminosis B_1; Drs. Sam Z. Levine and E. Marples discuss the status of the color tests for vitamin B_1; Dr. Tom D. Spies presents the relation of nicotinic acid to pellagra and its implication for a diagnostic test; and Drs. Chester J. Farmer and

Arthur F. Abt detail methods for titration of plasma ascorbic acid as a test for latent avitaminosis C.

The Wheel of Health. By G. T. Wrench, M.D. London: The C. W. Daniel Company, Ltd.: 1938, pp. 146. Price 6″/– net.

Taking his cue from the writings of Sir Robert McCarrison, Dr. Wrench presents the results of his investigations of a people said to be unsurpassed by any Indian race in perfection of physique—long lived, vigorous in youth and age, capable of great endurance and enjoying a remarkable freedom from disease.

He takes for his thesis that health depends on environmental wholeness, of which a "whole diet" is the vital factor, and that a whole diet means not only the right sorts of food but the right cultivation of soil as well. He examines the agricultural technic of the Hunza people who live "where India meets Afghanistan and the Chinese Empire, and is closest to the Soviet Republic". He demonstrates most convincingly what an essential part of the wheel of health—from man to soil, from soil to plant, from plant to man—is the farmer's renewal and protection of the soil.

There have been other observations of what might be termed "whole-diet" experiments—that of Hindhede during the last years of the World War, the diet of the Faroe Islanders, the Icelanders, the Eskimo and the American Indian. But Dr. Wrench has made an all embracing study by his investigations not only of the Hunza diet but of their methods of agriculture. The chief characteristic of this diet is that the children are breast-fed up to three years, and the foods of the people consist chiefly of whole grain products, leafy green vegetables, pulses, fresh milk and buttermilk, clarified butter and cheese, fruit, meat on rare occasions, and occasionally wine made from grapes.

Dr. Wrench believes that the physique of the Hunza people is largely dependent upon the health of their plant growths, which in turn are dependent upon the perfection of their methods of soil conservation. When the soil is neglected Nature hits back and she strikes with disease not only to the plant but to man. He quotes Professor F. H. King's book entitled *Farmers of Forty Centuries* which describes the methods of soil conservation carried on by the Tibetans, the Chinese, and other races through centuries. Of the Western system he says, "man is the most extravagant accelerator of waste the world has ever endured. His withering blight has fallen upon every living thing within his reach, himself not excepted; his besom of destruction in the uncontrolled hands of a generation has swept into the sea soil-fertility which only centuries of life could accumulate—fertility which is the substratum of all that is living."

Manual of Diets (Third edition) Montefiore Hospital, New York City, 1938, pp. 33.

This manual, prepared under the auspices of the medical board, with the collaboration of Lenna F. Cooper and her staff of the Department of Nutrition, sets forth a series of standard dietary prescriptions. Montefiore Hospital provides the largest number of special diets to ward patients of any hospital in Greater New York. The contents of the manual have been revised and brought up-to-date. The more commonly used diets such as endentulous, tubercular, high and low caloric, and high vitamin diets, are covered in brief yet complete detail.

CURRENT LITERATURE

American Journal of Digestive Diseases

Vol. 5, December 1938

*Untoward effects resulting from the use of large doses of vitamin B_1. C. L. Steinberg.—p. 680.

*Digestion and absorption in a man with three feet of small intestine. E. S. West, J. R. Montague and F. R. Judy.—p. 690.

LARGE DOSES OF VITAMIN B_1. Large doses of vitamin B_1 are capable of irritating the peripheral nerve plates. This toxic symptom occurs in only a very small percentage of cases treated with massive doses of vitamin B_1. When an individual so treated begins to complain of intense burning pain in an unsuspected area, the administration of this vitamin should be stopped.

ABSORPTION WITH THREE FEET OF SMALL INTESTINE. Digestion and absorption in a man with three feet of small intestine has been studied over a seven day period. The assimilation of carbohydrate was found to be normal. About 25% of the ingested protein and 45% of the fat was lost in the feces. The fecal fat contained a large proportion of free fatty acids indicating fairly satisfactory digestion of fat and poor absorption of fatty acids. A high calcium and viosterol intake was necessary to keep the man in positive calcium balance.

American Journal of Diseases of Children

Vol. 56, November 1938

*Iron deficiency in pregnant rats: its effects on the young. H. L. Alt.—p. 975.

*Value of an increased supply of vitamin B_1 and iron in the diet of children. P. Summerfeldt and J. R. Ross.—p. 985.

*Vitamin C in human pregnancy and lactation. I. Studies during pregnancy. H. M. Teel, B. S. Burke and R. Draper.—p. 1004.

*Vitamin C in human pregnancy and lactation. II. Studies during lactation. T. D. Ingalls, R. Draper and H. M. Teel.—p. 1011.

IRON DEFICIENCY. Female albino rats were fed an exclusive diet of whole milk powder and were subject to one or two pregnancies. A single pregnancy did not cause anemia in the female rat but resulted in a marked depletion of the iron content of the liver. A second pregnancy resulted in moderate anemia due to deficiency in iron. First litter offspring had normal hemoglobin values at birth but offspring from the second litter showed a decrease in hemoglobin content. Iron supplements completely protected the mother and the offspring against iron deficiency.

AUGMENTED DIET OF CHILDREN. An average diet enriched with protective food elements, including the vitamin B complex and iron, brought about an accelerated weight gain in children. The hemoglobin content of the blood was increased.

VITAMIN C IN PREGNANCY. The maternal need for vitamin C is considerably increased during pregnancy. The fetus *in utero* acts parasitically on the mother with respect to vitamin C. So long as appreciable amounts of ascorbic acid are present in maternal plasma, the fetus tends to take what it needs.

LACTATION. Vitamin C nutrition in nursing infants is dependent on the ascorbic acid content of the breast milk, which is in turn influenced by the vitamin C intake of the mother. The increased maternal need for vitamin C during pregnancy persists during the nursing period.

American Journal of Physiology

Vol. 124, December 1938

*Changes in the fat, carbohydrate and protein appetite in vitamin B deficiency. C. P. Richter, L. E. Holt, B. Barelare and C. D. Hawkes.—p. 596.

*The effect of vitamin B_1 and the vitamin B_2 complex on the weight, food intake, and estrual cycle of hyperthyroid rats. V. A. Drill and C. R. Sherwood.—p. 683.

APPETITE IN VITAMIN B DEFICIENCY. Nine animals on an adequate self-selection diet of pure foodstuffs were rendered deficient in vitamin B by the omission of yeast from the diet. There was a rapid loss of weight. All of the animals showed signs of polyneuritis and facial dermatosis. The animals displayed a marked aversion for carbohydrate and protein and a craving for fat. When given access to yeast, the animals consumed it eagerly and thus corrected the deficiency.

EFFECT OF VITAMIN B IN HYPERTHYROID RATS. Vitamin B_1 and yeast will enable hyperthyroid

rats which have lost weight to regain their lost weight while still receiving thyroid gland. A rich source of the vitamin B_2 complex is necessary for this gain to take place.

American Journal of Public Health

Vol. 28, December 1938

*Present status of dental caries in relation to nutrition. N. Simmonds.—p. 1381.
*Raw or pasteurized milk? Editorial.—p. 1424.

DENTAL CARIES AND NUTRITION. A highly satisfactory diet not only for expectant and nursing mothers and young children but for persons of all ages is a major factor in attaining the goal of preventive dentistry, preventive medicine, and nutrition. Such a diet is of importance for general health and for making the best teeth possible in the face of personal idiosyncrasies. It is probable that diet plays its greatest rôle in building good teeth during the first 10 years of life. It is not known why certain persons are less susceptible to dental caries than others. If an individual is susceptible to tooth decay, he should reduce his intake of all sweet foods to a minimum and include vitamin D together with all the other essential nutritional factors in his diet.

RAW OR PASTEURIZED MILK? In England 8000 school children were given raw or pasteurized milk as a supplementary diet. Whether comparisons were made of the increments of growth in the total of children or in sub-division by age, area, and clinical assessment, no consistent difference was apparent between children whose supplement was two-thirds pint of pasteurized milk and the children whose supplement was two-thirds pint of raw milk.

Journal of Biological Chemistry

Vol. 126, December 1938

*Studies on the relative efficiency of vitamin D from several sources. I. Influence of vitamin D of different origins on bone ash and body weight of the chicken. J. T. Correll and E. C. Wise.—p. 573.
*Studies on the relative efficiency of vitamin D from several sources. II. Influence of vitamin D of different origins on the serum phosphatase of the chicken. J. T. Correll and E. C. Wise.—p. 581.
*The endocrine control of lipid metabolism in the bird. II. The effects of estrin on the blood lipids of the immature domestic fowl. F. W. Lorenz, I. L. Chaikoff and C. Entenman.—p. 763.

VITAMIN D EFFICIENCY. Several samples of tuna liver oil have been shown to be only 40 to 60% as effective as cod liver oil. Vitamin D has a definite influence on the body weight of the chick when supplemented in a diet adequate in all other known vitamins.

SERUM PHOSPHATASE. Under the influence of an adequate amount of vitamin D the high serum phosphatase concentrations of the growing chick decrease, approaching a normal level of 20 units per 100 cc. of serum for adult birds. In the absence of vitamin D in the diet the phosphatase concentration has been shown to rise to values of over 200 units for highly rachitic chicks. Cod liver oil was more efficient than irradiated ergosterol and the tuna liver in reducing the phosphatase activity in the serum of the growing chick.

EFFECT OF ESTRIN ON BLOOD LIPIDS. Estrin raises the blood lipids of the immature female bird very rapidly. The blood lipids of the male bird also respond to estrin. All lipid constituents: namely, cholesterol, phospholipids, and neutral fat, share in the rise, but the most pronounced effect is produced upon the neutral fat.

Journal of Nutrition

Vol. 16, December 1938

*Effects of prolonged use of extremely low-fat diet on an adult human subject. W. R. Brown, A. E. Hansen, G. O. Burr and I. McQuarrie.—p. 511.
*The effect upon hematopoiesis of variations in the dietary levels of calcium, phosphorus, iron and vitamin D. H. G. Day and H. J. Stein.—p. 525.
*Theoretical and actual caloric requirements. I. M. Rabinowitch.—p. 549.
*Destruction of vitamin A by rancid fats. E. J. Lease, J. G. Lease, J. Weber and H. Steenbock.—p. 571.
*The lack of nerve degeneration in uncomplicated vitamin B_1 deficiency in the chick and the rat. R. W. Engel and P. H. Phillips.—p. 585.
*The relation of growth and nutrition to the reticulocyte level in the young rat. H. L. Alt.—p. 597.
*Nutritional effects of the addition of meat and green vegetable to a wheat-and-milk diet. H. L. Campbell and H. C. Sherman.—p. 603.
*The utilization of calcium. F. F. Tisdall and T. G. H. Drake.—p. 613.

EFFECT OF LOW-FAT DIET. An adult human subject was maintained for a period of 6 months on a nearly fat-free diet without demonstrable harm. Young rats placed on the same diet developed the typical fat deficiency syndrome.

The human subject could probably not subsist indefinitely on a diet completely devoid of the unsaturated fatty acids.

CALCIUM AND PHOSPHORUS UTILIZATION. Investigations have been made of the effect on hematopoiesis in rats of variations in the dietary levels of calcium, phosphorus, iron and vitamin D. Calcium *per se* did not have a unique function in hematopoiesis. A relative or absolute excess of phosphorus caused mild anemia and polycythemia. Vitamin D facilitated hematopoiesis, presumably through its effect upon calcium and phosphorus metabolism.

CALORIC REQUIREMENTS. From the experiences with 500 diabetics, it is shown that bodily equilibrium may be maintained with diets the caloric contents of which are much below the generally accepted standards. With these diets, the average loss of weight was very much less than expected theoretically. The body may have available some unrecognized source of energy.

VITAMIN A AND RANCID FATS. Rancid fats were found to destroy pure carotene and vitamin A or precursors thereof as contained in halibut liver oil, egg yolk, or alfalfa. Fats which had been heated at such temperatures as are frequently used in cooking were found to destroy vitamin A to some extent. Vitamin A was not destroyed when given to rats on an empty stomach even though they were being maintained on a ration rich in rancid fat.

NO NERVE CHANGES IN B_1 DEFICIENCY. The administration of beta-carotene or percomorph oil together with riboflavin removed all evidence of pathology in the peripheral nerves of vitamin B_1 deficient chicks or chicks fed an adequate ration at a restricted level of intake.

RETICULOCYTES AND GROWTH. Young rats were given a diet either deficient in tryptophane or in total energy. Loss in weight was accompanied by a rapid decrease in the reticulocyte level in the blood. With realimentation the gain in weight due to growth and improved nutrition was associated with a parallel increase in the reticulocyte count.

DIVERSIFICATION OF A GOOD DIET. The addition of fresh meat and green beans to the dry diet of rats was found to bring about more rapid early growth, attainment and maintenance of larger adult size, and earlier maturity. It also prolonged very slightly the period of adult vitality as measured by the ability of the females to bear young. It did not significantly influence the length of life.

UTILIZATION OF CALCIUM. When calcium was added to a low calcium but otherwise normal diet, the percentage of calcium retained was essentially the same regardless of source. The addition of calcium, in the form of large amounts of spinach, to a low calcium diet resulted in a reduction rather than an increase in the body calcium. This effect is probably due in part to the oxalic acid content of the spinach. The inadequacy of an average human diet low in milk, as a source of calcium, has been biologically demonstrated. Not only is the calcium retention on this diet low but the percentage of the calcium retained is less than in the same diet with added milk.

Journal of the American Medical Association

Vol. 111, December 3, 1938

*The medical management of chronic ulcerative colitis. T. T. Mackie.—p. 2071.

Structure of proteins. Editorial.—p. 2120.

Vol. 111, December 10, 1938

*Extreme obesity followed by therapeutic reduction of 239 pounds. J. J. Short.—p. 2196.

Vol. 111, December 17, 1938

*Radioactive iron. P. F. Hahn, W. F. Bale, E. O. Lawrence and G. H. Whipple.—p. 2285.

*Nicotinic acid. W. H. Sebrell and R. E. Butler.—p. 2286.

*Formation of milk proteins. Editorial.—p. 2305.

Vol. 111, December 24, 1938

*Destruction of vitamin C in the gastrointestinal tract. Editorial.—p. 2395.

CHRONIC ULCERATIVE COLITIS. Adjustment of the diet to the needs of the patient with chronic ulcerative colitis is essential. A high protein, low carbohydrate diet is better tolerated than the conventional high carbohydrate "colitis diets". The possibility of food allergy cannot be overemphasized. The vitamin and mineral content must be maintained at levels above the requirements of the normal individual.

OBESITY. A patient weighing 395½ lb. reached a low weight of 156½ lb. in 20 months on a 600 calorie diet and thyroid extract. There was

progressive improvement in health throughout the entire period and subsequently.

RADIOACTIVE IRON IN ANEMIA. Five dogs were maintained on a diet low in iron and kept anemic by frequent bleeding. They were then fed radioactive iron. The absorption of iron was dependent on the need of the body for this element.

NICOTINIC ACID. Nicotinic acid in daily doses of 50 mg. produced transient, unpleasant but harmless reactions in 4 of 6 adult women on a diet restricted in the pellagra-preventive factor. Although the reactions are disagreeable, they persist only a short while and there is no evidence that any harm results. Their occurrence should not be allowed to interfere with the therapeutic use of large doses of nicotinic acid.

FORMATION OF MILK PROTEINS. Some dairy cows have made records of 100 lb. of milk a day. This means an annual loss by way of the mammary glands of 150 lb. of ash, 25 lb. of calcium, ten times the organic matter contained in the cow's body and more than 1000 lb. of protein. The constituents of the blood from which the milk proteins can be synthesized by the mammary glands are amino acids, serum globulin and certain nitrogenous compounds of unknown nature. The process of elaboration of milk is accompanied by intense nitrogen metabolism of another sort, which may be concerned with protein synthesis. The gland forms urea in the course of its activity.

DESTRUCTION OF VITAMIN C. Sufficient gastrointestinal fermentation of vitamin C may take place in certain persons to cause vitamin deficiency.

Journal of the American Dental Association and Dental Cosmos

Vol. 25, December 1938

*Studies on dental caries. VIII. Relative incidence of caries in the different permanent teeth. J. W. Knutson, H. Klein and C. E. Palmer.—p. 1923.

DENTAL CARIES. Girls have a higher incidence of caries in each type of tooth for each chronological age than boys. In both sexes, the number of carious first molars is higher than that of any other tooth.

Medical Officer

Vol. 60, November 12, 1938

*An investigation into the nutrition of children of school age. L. Roberts, D. M. Stone and V. P. Bowler.—p. 209.

Vol. 60, November 19, 1938

*An investigation into the nutrition of children of school age. L. Roberts, D. M. Stone and V. P. Bowler.—p. 219.

Vol. 60, December 10, 1938

An inquiry into malnutrition and rickets. H. Herd.—p. 249.

*Bony deformities, dental caries and rickets. E. H. Wilkins.—p. 250.

NUTRITION OF CHILDREN. Children are classified nutritionally as excellent, normal, slightly subnormal or poor. Children between 9 and 10 were carefully examined, home conditions studied and blood examinations made. It was observed that a marked degree of malnutrition may co-exist with an apparently normally functioning bone marrow.

NUTRITION OF SCHOOL AGE CHILD. A well nourished child is superior to a poorly nourished one in almost every respect. He is taller, heavier, more robust, stands better, has a more healthy color, a better chest expansion, more regular teeth, is less prone to bronchitis and has suffered less from rickets. The health and capabilities of the mothers in the well nourished group were better than the others. The economic state of the family appears to be the most important cause of malnutrition.

BONY DEFORMITIES. Freedom from rickets cannot be assured without the addition of some vitamin D concentrate during infancy. The higher economic class showed less evidence of rickets and better posture and quality of skin, lower mortality and morbidity rates and better growth.

Nebraska State Medical Journal

Vol. 23, December 1938

*Obesity. E. W. Hancock.—p. 452.

OBESITY. The first essential in the obesity diet for children is that it be sufficiently restricted. Less than 1000 calories is usually necessary. The second essential is that the diet be as complete as possible and properly supplemented with necessary vitamins. A sample 900 calorie diet is presented. Thyroid extract is given.

Southern Medical Journal

Vol. 31, December 1938

*Recent observations on the treatment of six hundred pellagrins with special emphasis on the use of nicotinic acid in prophylaxis. T. D. Spies, J. M. Grant, R. E. Stone and J. B. McLester.—p. 1231.

NICOTINIC ACID IN PELLAGRA. A full diet with nicotinic acid and, when necessary, vitamin B_1, represents an advance over anything yet offered in the treatment of pellagra. The nicotinic acid supplement to the diet only relieves a deficiency of nicotinic acid. Its greatest value comes when it is added to a full, well balanced diet.

INSTITUTION MANAGEMENT

The American Restaurant Magazine

Vol. 21, December 1938

*Mr. Strause looks over the holidays. M. B. Strause.—p. 20.
*Your emergency shelf.—p. 23.
*Time table menus mean . . .? G. L. Wenzel.—p. 24.
*Mr. Billings must know the answer. R. Billings.—p. 31.
*New equipment.—p. 46.

NEW IDEAS. You can create interest in your menus by changing your recipes to make them sound new. Gives famous recipe for mince-meat pie using 8 oz. of finely ground corned beef to every 10 lb. of mince-meat, cider for liquid and addition of brandy after pie is baked. A new sauce to serve with the pie is included.

EMERGENCY SHELF. Tells how the well-stocked emergency shelf may help to solve the problem of unexpected guests. A "snack menu" for this holiday trade is recommended to bring new customers and greater profit.

LONG MENUS. The lengthy menu is an extravagant system in restaurant operation. The simpler the menu, the oftener new dishes may be added and the quicker the customer can make his selection. There are six important points to consider in menu merchandising, all of which are based on serving a limited variety of foods at popular prices. Limited menus make it possible to take advantage of low-cost market items more quickly. Large purchases of a smaller number of items allow more time for selection and checking quality, weight and yield; thus fewer mistakes in portions will result and labor will be lessened. There will also be fewer leftovers and less cash tied up in the ice box. Determine popular dishes by daily sales records, serve dishes customers like, perfect these dishes, keep recipe cards and perfect recipes of all new dishes before serving.

QUESTIONS AND ANSWERS. Prolonged waiting for orders by waitresses is strictly a management problem and one of the biggest sources of faulty service. It is not always extra help that is needed but extra time and thought spent to effect sound management control through waitress scheduling and training. A survey has shown that better control of food is secured when skilled cooks are relieved of vegetable preparation. Cooks are paid according to a "skilled labor" classification while vegetable preparation calls for unskilled labor. The saving in wages justifies relieving cooks of this duty.

EQUIPMENT. Low cost and portability make the Curtis Store and Office Cooler adaptable to many restaurants. It needs only water and electric connections and requires but 5½ sq. ft. of floor space. The unit cools, dehumidifies, circulates and filters.

A new hand-operated burnisher is on the market known as the Adam Silver Burnisher by Kraeft of New Jersey. It operates on the drainboard of a sink or dish table and has a capacity of 75 pieces an hour.

"Sav-a-Cloth", manufactured by the Coverette Company, Chicago, saves on table linen. It is a transparent cloth, non-inflammable, not affected by hot liquids, liquor, or acids and available in three convenient sizes, 40 x 40, 48 x 48, and 48 x 60 in.

To clear drains, the Empire State Drain Clearing Corporation of New York City has introduced a hand-operated pressure pump which generates air pressure to 125 pounds and may be used on any type of drainage system up to 6 in. soil line.

U. S. Slicing Machine Company of Indiana has a machine for slicing bacon and boneless meats for increased yield and more profit. A

slab up to 24 in. long may be sliced without re-adjusting and the last slice is salable. There are adjustments for 20 thicknesses.

A new table accessory called the "Tappit" has a washable glass container with a rubber button at the top. By tapping it guests may be served jams, mustard, or any condiment in a quick, clean and fascinating manner. It is a product of the Food Dispenser Company, Hartford, Connecticut.

A patented device on the "Quicklick" mop made by the Quicklick Mop Company, Chicago, enables one to wring it almost dry. The parts are cadmium plated, the head of non-linting yarn and the French-finish stick of hard maple.

Chain Store Age

Vol. 14, December 1938

*Record-keeping simplified for social security, wages and hours. F. E. Landau.—p. 12.
*Strike up the band—Act 1 of showmanship in business. Z. Kaufman.—p. 14.
Gaining momentum in extended sales contests. E. Corless.—p. 16.
Are chain stores in the public interest? G. M. Lebhar.—p. 17.
*How one chain is cutting costs. H. C. Naylor.—p. 21.

RECORDS. The third in the series of articles on methods of handling social security and wages and hours records. A "Payroll Report" gives a complete breakdown of earnings and a comparison with the standard. An "Employment Changes" card shows any change in wage. With this card and with the same heading is another which accounts for new names on the payroll by several divisions; new employee, returned, transferred, discharged, resigned, and overtime relief. Four-sided double cards are used for "Personnel Log" which contains all personal information, bond record and number. It is arranged in order by states, payroll and store number. A special tax card is used with license permission under patent.

SHOWMANSHIP IN BUSINESS. The mystery, if there is one, about the ever elusive and important factor, showmanship, is to be solved in a series of articles. The results to be thus attained are mainly attention, emphasis, and appeal to the emotions.

CUTTING COSTS. Many expenses are controllable. Cutting costs often means that wages can be kept the same or even increased. Suggestions for methods of control of expenses work best when employees have a part in the plans and procedures.

Consumers' Guide

Vol. 5, October 1938

How high is your consumer I.Q.?—p. 3.
*New shrinkage rules for cotton consumers.—p. 7.
*Your food supplies and costs.—p. 16.

SHRINKAGE RULES. Federal Trade Commission declares that labels on cotton goods stating claims in regard to shrinkage must specify the terms and may be used only on goods which have actively undergone the shrinkage process. The label must guarantee that cotton goods will not shrink more than a stated per cent. A manufacturer may label a garment thus: "These goods have been shrunk (or preshrunk) to the extent that residual shrinkage will not exceed 1% when tested in accordance with the recognized and approved standards or tests." Or the label may read: "Preshrunk—residual shrinkage 1%." Residual shrinkage used here means simply that the product will shrink further, even though it has been subjected to shrinkage process, but such shrinkage will not exceed 1 or 2%, as indicated. Terms "full shrunk", "shrink-proof", "nonshrinkable", and similar terms are banned as misleading. Tests must be standardized. The consumer is asked to report all cases where garment does not live up to claims and to insist on labeling, for laws do not compel manufacturer to label goods.

FOOD COSTS. Retail costs are slightly higher over September 1938 but lower than in 1937. Eggs are higher but cereal, bakery goods, turkey, canned fruits and vegetables, fruit, meat with exception of fresh pork, veal and leg of lamb are low. Dairy products remain unchanged and the price of fresh vegetables was expected to rise after November.

The Horwath Hotel Accountant

Vol. 18, December 1938

*Some thoughts on food control. L. Kozel.—p. 2.
*Index 1938.—p. 3.
*Housekeeping and maids' payrolls.—p. 5.
*Club operating ratios.—p. 6.
*Food and beverage costs.—p. 7.

FOOD CONTROL. Adequate and efficient control for large restaurants requires a division of

operations into producing units with an analysis of individual commodities and groups comprising the unit. In the kitchen, the most important producing unit, the common faults that stand in the way of proper cost are faulty buying, careless receiving, poor storage, failure to use by-products advantageously, poor menu planning and pricing, over-production, failure to adhere to standard portions, inadequately priced banquet menus, pilfering, and failure on part of waiters to urge profitable dishes.

INDEX. A complete alphabetized list of statistics and addresses published in the *Horwath Hotel Accountant* during 1938 is presented.

PAYROLL. Data on the ratio of maids' (includes all maids, bath maids, cleaning maids etc.) payroll to room sales, number of rooms a maid can take care of each day, and the cost per occupied room per month for total housekeeping department salaries and wages, and for maids only, is presented in chart form. The number of occupied rooms per maid per day according to average rates varied from 7.6 for rooms over $4; 10.5 for rooms $3 to $4; and 12.3 for rooms at $2 to $3 during the highest occupancy month. The data is based on 24 transient hotels of various sizes and average room rates and is presented for the months of highest and of lowest room sales, showing payroll reductions in relation to occupancy shrinkage.

OPERATING RATIOS. Annual profit and loss summaries of two large clubs, in percentage form, are presented. Both operated at a loss, which had to be covered by membership dues. One club receiving revenue from rooms had a loss of 27% of sales; the club having only restaurant and miscellaneous facilities had a loss of 69%. The first club balanced accounts in the restaurant department; the second had a substantial loss. Payroll ratios of both were between 56% and 60% of total sales. Administrative and general expenses were 58%, exclusive of room sales, in the first club and 62% in the second. The rooms department in the first club had a departmental profit of 52%; the general average in hotels is 75%.

FOOD AND BEVERAGE COSTS. Average food cost per dollar sale in September 1938 was 5% below that of September 1937. The wholesale price index shows average prices during September 15% below a year ago. Average beverage cost was 1% below September 1937.

Hospitals

Vol. 12, December 1938

*Personnel organization chart.—p. 14.
*Sanatorium administration. B. W. Black.—p. 25.
*Modernizing hospital accounting. H. Retzlaff—p. 43.
*Refrigeration space.—p. 94.

PERSONNEL ORGANIZATION CHART. A detailed chart of internal personnel organization by departments includes dietary departments for a 100-bed and a 400-bed hospital.

SANATORIUM ADMINISTRATION. A former medical director of the U. S. Veterans Bureau, and a hospital authority of international reputation, describes ways of meeting new situations in tuberculosis sanatorium administration. High caloric, high vitamin diet requires good menu planning and quality food preparation to stimulate patients' appetites.

MODERNIZING HOSPITAL ACCOUNTING. Details of budget planning and control for the dietary and other departments of a hospital.

REFRIGERATION SPACE. The amount of refrigeration space needed for food storage varies according to the accessibility of markets and policy for buying perishables. Type of service and size of hospital are varying factors.

Hospital Management

Vol. 46, November 1938

*Hospital menus, then and now. M. E. Smith.—p. 38.
Book shelf additions.—p. 39.
*September food prices show increase.—p. 40.
A. D. A. convention notes.—p. 41.
Chatterbox topics.—p. 41.

HOSPITAL MENUS, THEN AND NOW. How hospital menus have changed over a period of years is told by Mary E. Smith, dietitian, Memorial Hospital, Houston, Texas, who made a study of 12 years' menus in the same hospital.

SEPTEMBER FOOD PRICES INCREASE. Figures from R. M. Grinstead and Company food index.

The Hotel Monthly

Vol. 46, November 1938

*The tip question.—p. 6.
*Some observations on the A. H. A's proposed hotel advertising program.—p. 15.

*Menu exhibit, Mr. Shircliffe's.—p. 26.
*Sanitation of the drinking glass.—p. 38.
Jobs open to people over forty. M. L. Wise.—p. 39.
*Hotel cleaning problems. T. S. Blair.—p. 40.
*The Waldorf-Astoria's milk bar.—p. 57.
*A cure for the wabbly table.—p. 62.

TIPPING. The subject is reviewed from 1894–1913 but still leaves the question unsettled. The word "tip" originated in coffee houses when the phrase, "To Insure Promptness", was written over collection boxes attached to the wall.

HOTEL NATIONAL ADVERTISING CAMPAIGN. Describes the intensive study of the problem of advertising the hotel business, cooperatively and nationally, now being undertaken by a committee. The object is not to stimulate travel as some have suggested but to stimulate new business from the large group of travelers who now do not stop in hotels. The question has many limitations and problems but of several hundred letters received by *The Hotel Monthly* on this subject, 58% are favorable, 27% unfavorable and 15% non-committal. Coming issues will contain much food for thought on this question.

MENU EXHIBIT. Arnold Shircliffe exhibited 1000 of his collection of menus at the Milwaukee convention of the American Dietetic Association. These menus showed the changes in eating habits from the early days when game was plentiful and popular down to the modern dietaries of today. The exhibition clearly showed the advancement and progress in foods and menus.

DRINKING GLASS SANITIZATION. The National Association of Sanitarians has published a 60-page booklet on the different methods of washing and sanitizing drinking glasses; treatment of the water; degrees of heat; use and kinds of chemicals; results of chlorinated rinse and 101 do's and don't's on glass washing. The book covers "Methods and Procedures", "Practical Control" and includes an important chapter on the use of paper cups.

LAUNDRY. A simple check list of laundry operations aids in securing the maximum length of service from hotel linens. Three main considerations are the quality of work, preservation of linens and production costs. Under the first are classifying, proper loading (as 4½ lb. of dry clothes per cubic foot of cylinder space), maximum speed of the wheel, water levels, and chemicals. Three causes for linen depreciations are misuse by maids and guests, poor classification, and improper application of washing formulae. Temperature, bleach, rinsing and sour are carefully analyzed for best results. Costs may be compared with the figures compiled by the National Institutional Laundry Manufacturers and the National Executive Housekeepers Association.

MILK BAR. The Waldorf-Astoria has set the fashion with a milk bar which serves milk, sodas, and soft drinks. A large number of guests stop at this type of bar who would not patronize the liquor bar. The demand is said to have originated with the debutantes.

WABBLY TABLES. The real way to cure the wabbly table is to use the "Adjusta Glide" or caster which is a simple and inexpensive device permitting the gadget to be adjusted up or down as necessary.

Journal of Home Economics

Vol. 30, December 1938

*Co-ordination of research in home economics with public health in the field of nutrition. F. G. Boudreau.—p. 677.
*Prerequisite training and internship for the school lunchroom manager. W. S. Pendergast.—p. 684.
An open letter to herself. K. Roos.—p. 706.
*Mrs. Richards' contribution to the wool industry. G. Winegar.—p. 708.
*International management congress. Editorial.—p. 711.
*International congress of home economics. Editorial.—p. 713.
American vocational association. Editorial.—p. 714.
*The ascorbic acid content of celery. R. A. Osterman.—p. 715.
*Losses of vitamin C during the cooking of certain vegetables. F. Fenton and D. K. Tressler.—p. 717.

RESEARCH, NUTRITION, PUBLIC HEALTH. Malnutrition is prevalent throughout the world. Scientific facts to work with are adequate, but mass education is needed. Unfortunately, little has been done except in the form of "public education". Suggestions for actual work with school children in nutrition and methods of promoting general interest are given.

TRAINING FOR SCHOOL LUNCH MANAGERS. School lunchroom administration has unlimited possibilities for the well trained, experienced home economics graduate. To get best results for school children and taxpayers a fifth year of training is becoming increasingly essential. Detroit has been giving a course including supervision of responsibility, actual training, lectures and theory, that combines apprenticeship and assistantship.

CLEANING OF WOOL. Mrs. Ellen H. Richards made another contribution to the home when she discovered the naphthalated process of cleaning wool. A description of her experiment to scour wool without waste of natural grease (suint) is given. This process requires a high quality of naphtha of about 86 degrees. Other similar solutions have now been found. The commercial application of this discovery is still used by the Arlington Mills under the Maertens patents. The process cleans without damage to the life, strength and resiliency of the fibers.

INTERNATIONAL MANAGEMENT CONGRESS. The next International Management Congress meets in Sweden in 1941. One of the most interesting reports of the 1938 congress concerned increasing importance of consumer buying. Other outstanding trends of the work are the emphasis on group life, the need of further research and the demand for education. There is also a growing emphasis on managerial ability in the home and relationships of the family.

INTERNATIONAL CONGRESS OF HOME ECONOMICS. The congress is to be held in Copenhagen, Denmark, the week of August 21. Subjects for discussion are: progress, direction of home economics training for girls and the sensory aids now available for teaching.

ASCORBIC ACID CONTENT OF CELERY. A study of the vitamin C content of green Utah and white California celery showed that the amount of green in the celery is the determining factor. Inside white stalks of both kinds have the same content. The leaves have a content three to four times as high as the stalks.

LOSSES OF VITAMIN C. Charts of studies upon carrots, chard, peas and frosted peas are given. There is no difference in content between cooked fresh or frosted peas. Only 5–15% of the vitamin was actually destroyed in cooking but 33–53% was found in the cooking water. Time of greatest solvency occurred in first two minutes of cooking. Some variable contributing factors are the size of pieces of vegetable, amount of water and length of time left standing after seasoning.

Modern Hospitals

Vol. 51, December 1938

*Holiday favors and feasts. A. E. Boller.—p. 90.
*Seafood suggestions. I. N. Young.—p. 96.
Food for thought.—p. 98.

HOLIDAY FAVORS AND FEASTS. Menus and favors used at Christmas in several hospitals.

SEAFOOD SUGGESTIONS. Article gives table showing food values of canned fish and sea foods and includes several recipes for use.

The Nation's Schools

Vol. 22, December 1938

*To develop a richer vocabulary. R. E. C. McDougall.—p. 17.
*Equipped for wall washing.—p. 47.
*When light is made right. J. W. Smith.—p. 48.
*A room for health. G. G. Starr.—p. 51.
*Ice cream tops them all. E. H. Handy.—p. 53.
*Cafeteria trains youth. N. Fredenburg.—p. 55.
Food service directors' meeting assumes national importance.—p. 57.

VOCABULARY DEVELOPMENT. Reading should be taught with a view to development of wider vocabularies for the school child. Wide supplementary reading and encouragement by the teachers will improve the exchange and expression of ideas by the pupils.

WALL WASHING. Instructions for construction of scaffold, list of materials needed, and methods of procedures used for efficient wall cleaning is contained in "A Manual on the Construction and Care of School Buildings" published by the Oregon Department of Education.

SIGHT SAVING. Functional experiments in teaching students the principles of light dispersion and sight saving in the Lincoln Junior High School, Wyandotte, Michigan, schools, lists valuable supplementary teaching material procurable from the Better Vision Institute,

General Electric Company, Westinghouse Electric and Manufacturing Company and the Metropolitan Life Insurance Company.

HEALTH ROOM. Complete description of health room in Arcanum, Ohio, used for observation, treatment of injuries, segregation of pupils with contagious disease symptoms, physical examinations, and monthly measurement of height and weight. Suggested as means of promoting health education.

ICE CREAM MANUFACTURE. New developments in ice cream manufacture and service, with discussion of value of ice cream in diet, formulae used in making ice cream for students, and set-up and uses of equipment within lunchroom organization.

HIGH SCHOOL COMMERCIAL FOOD COURSE. Development of new commercial food course in Topeka, Kansas, high school, providing vocational training in quantity food production, with opportunity for actual experience in school cafeteria, and apprenticeships in restaurants following school training.

Occupations

Vol. 17, December 1938

*An analysis of occupational aims of college students. E. D. Sisson.—p. 211.
*The W. P. A. prepares women for housework. E. S. Woodward.—p. 220.

OCCUPATIONAL AIMS OF STUDENTS. Investigators find that influence of parents and successful acquaintances is more powerful in determining career choice of students than natural ability, opinion of teachers, or school success; that students tend to aim at professions, disregarding definite overcrowding and competition, occupational level of parent, and significances of heredity and individual differences.

W. P. A. TRAINS HOUSEWORKERS. Ever growing shortage of competent household help, coupled with large number of unemployed, untrained women, leads W. P. A. to initiate household training centers, pointing the way to establishment of standards of efficiency to be met by household workers, and standards of wages, hours and conditions in household employment to be met by employers.

School Life

Vol. 24, December 1938

Teacher education.—p. 69.
Business education.—p. 72.
*Home economics education.—p. 76.
New government aids for teachers. M. F. Ryan.—p. 86.
A new element in teacher training. E. C. Lombard.—p. 87.

EDUCATION. Article deals with the effective program of home economics education for intelligent participation in family life and discusses types of home projects used to make the work of the greatest value to pupil, adult and community.

Science Leaflet

Vol. 12, November 1938

*Looking ahead on the consumer program.—p. 30.

Vol. 12, December 1938

*The new food, drug and cosmetic act. O. Goodrich.—p. 32.

CONSUMER PROGRAM. Prices and consumer income are not in balance which answers the question why the consumer as a whole does not consume enough to satisfy his own needs or keep wheels of industry turning. Consumer must get standards established, obtain facts about goods and readjust basic price structure so that balance is reached.

FOOD AND DRUG ACT. New act of 1938 retains good features of 1906 law and adds many new features that remove some practices previously followed. The article states ways in which laws affect sale and manufacture of cosmetics and drugs not provided for by the old act.

THE AMERICAN DIETETIC ASSOCIATION

AVAILABLE REPRINTS

Community health education. Vivian V. Drenckhahn. 1938 ..... $.10
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Food, Poisons in—fantasy or fact? T. Swann Harding. 1938 ..... .05
Fruits and vegetables, Classification of, according to their carbohydrate content. Georgian Adams and Charlotte Chatfield. 1935 ..... .10
Labor, good, Maintaining standards in the hotel and restaurant industry. Marian L. Mel. 1937 ..... .15
Labor policies in hospitals. Grace M. Augustine. 1938 ..... .20
Meats, Cooked, and poultry classified by chemical composition. Charlotte Chatfield. 1937.. .10
Medical students, Applied dietetics for. Mabel W. Perry. 1938 ..... .10
Medical students, Teaching nutrition to. Estelle E. Hawley. 1938 ..... .10
Mineral additions to the soil, Correlation of copper and manganese content of plants and. Lila Miller and Helen S. Mitchell. 1931 ..... .10
Nursing curriculum, The place of nutrition in the. Henderika Rynbergen. 1938 ..... .10
Personnel management in the dietary department. Ruth H. Carpenter. 1938 ..... .05
Relief service, transient, The dietitian in. M. Faith McAuley. 1936 ..... .10
State institutions, The dietitian in. Florence Peters. 1938 ..... .10
State institutions, California, Food control in. Jane Sedgwick. 1938 ..... .10
Student majoring in food and nutrition or institution economics, Opportunities for the. E. Neige Todhunter. 1938 ..... .10
Vegetables, fresh, and the fuel consumed, A study of the waste in preparation and in cooking of. Elizabeth F. Whiteman and Florance B. King. 1938 ..... .10
Vitamins and hormones. John R. Murlin. 1938 ..... .10
*Case histories as teaching material in diet therapy. Helen J. Hubbell. 1929 ..... .50
*The Food Budget. 1937 ..... .50
*Examination Questions for Nurses in Normal Nutrition and Modifications of the Normal Diet in Disease. 1935 ..... .25
*Suggested Questions for Nurses Examinations in Normal Nutrition and Diet Therapy. 1937. .25
*Courses in Nutrition for Nurses. 1938 ..... .50
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* These are reports of separate problems which have never appeared in the JOURNAL but have been printed for distribution.

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NEWS NOTES

American Dietetic Association. The midyear meeting of the Executive Board will be held at the Drake Hotel, Chicago, February 11–12.

Anna M. Tracy, president of the A. D. A., spoke before the Louisiana Dietetic Association at its meeting in New Orleans on January 11. Her subject was "The Status of the American Dietetic Association." Miss Tracy spoke on January 13 at the State Fair in Lafayette, Louisiana. At this meeting her subject was "Opportunities for Men and Women in the Food Industries."

Helen S. Mitchell, chairman of the Professional Education Section of the A. D. A., and research professor of nutrition, Home Economics Division, Massachusetts State College, discussed "Facts and Falacies in Nutrition" on December 20 over N.B.C. during the Farm and Home Hour of the U. S. Dept. of Agriculture, Washington, D. C. The program was in the form of questions and answers, Dr. Mitchell replying to the questions of an official of the U. S. Dept. of Agriculture.

Jean M. Grant. The *Southern Medical Journal* for December 1938 carries an article on the use of nicotinic acid in the prophylaxis of pellagra, of which Miss Grant, a former student dietitian under Marie L. Hines of the University Hospitals of Cleveland, was coauthor with Drs. Spies, Stone, and McLester.

Dr. Eugene F. Du Bois, professor of medicine, Cornell University Medical College, delivered the third Harvey Lecture at the New York Academy of Medicine, December 15, on "Heat Loss from the Human Body."

Seventh International Management Congress. Mr. N. W. Barnes, executive secretary of the Congress, whose headquarters are at 347 Madison Ave., New York City, announces that non-members may now purchase the Proceedings of the Congress at $7.50, postpaid. Upon application to Mr. Barnes, a descriptive circular covering the scope of the proceedings of the conference will be mailed to those interested.

Vitamin Research. Mead Johnson and Company, Evansville, Indiana, has established an annual award of $1000, to promote interest in research on the water-soluble vitamin B complex, to be presented over a period of five years through the American Institute of Nutrition. The award will be given each year to the laboratory or clinical research worker in the United States or Canada who in the opinion of the judges has published the most meritorious report on the subject during the previous calendar year. Nominations may be sent at any time to Dr. Leonard A. Maynard, Laboratory of Animal Nutrition, Cornell University, Ithaca, N. Y. To be considered at any given spring meeting, the nomination must be received by January 15.

New York World's Fair, Inc., announces that physicians and public health workers visiting the fair will have their own Professional Club. The club will be housed in the main floor of the exhibit building and will include a lounge and several conference rooms for discussions of scientific advancements in medicine and sanitation.

Twenty-seven national and local women's business and professional organizations, headed by the American Women's Association of New York, will make it possible for out of town women visiting the World's Fair to go "backstage" in the big industrial, business and hospital centers of New York and see where and how women work. The trips will be known as "Career Tours" and are being arranged by the New York World's Fair Career Tour Committee. Lenna F. Cooper and Louise Stephenson of the Greater New York Dietetic Association have arranged a tentative list of tours to Greater New York hospitals, health centers, hotel kitchens, service and dining rooms, cafeterias, restaurants and tea rooms, as well as markets, that will appeal to those interested in the field of nutrition and dietetics.

American Congress on Obstetrics and Gynecology announces the annual meeting to be held in Cleveland, Ohio, September 11–15, 1939. Scientific exhibits of interest to the dietitian concern the subjects of maternal and neonatal care. The preliminary program includes discussions of diabetes and pregnancy,

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*Story of Vitamin B1, Tisdall, JAMA (1935) 105-1583

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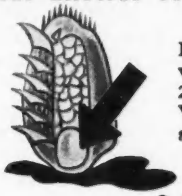

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nutritional factors and pregnancy, and extension education on maternal and neonatal care.

New York Career Tours Committee announces that the business and professional clubwomen of the United States will publish a book entitled *Women at Work—A Tour Among Careers* in February. The book has been written for and is dedicated to every woman who has ever knocked at an office door in search of a job. Among the organizations participating in this are the American Nurses' Association, Association of Women in Public Health, Greater New York Dietetic Association, Home Economics Association of Greater New York and National Executive Housekeepers Association.

Golden Gate International Exposition. The medical program for the Hall of Science will show the latest advancements in medical science, new methods of preventing disease, and methods of treatment. This "parade of medicine" is designed to appeal to the public and will emphasize the necessity of the constant cooperation of the patient with his physician. The exhibits will show the practical, particularly the financial, benefits of preventive medicine. These subjects and others will be clarified for the spectators by means of exhibits, motion pictures and lectures. The lectures will be presented in popular language and many will be directed especially to school children.

Among the sponsoring groups are the American and California Medical Associations, state and national dental associations, the American College of Physicians and the American Association for the Advancement of Science. The display sponsored by the American Medical Association includes material on four important fields of health work: the history of medicine; the various subjects involved in modern medicine; the contribution of medicine to public health; and how the combination of medicine and physics is effected.

Many educational and commercial organizations will take part in this portrayal of medical science. The story of insulin and its use to relieve diabetes will be told by the Eli Lilly Co. Charts, diagrams and animated models will explain the meaning of diabetes, the cause and hereditary factors and the treatment. The University of California, with the cooperation of a dozen famous universities, is sponsoring the largest exhibit in the Hall of Science, part of which will be devoted to medicine. Dr. Chauncey D. Leake, professor of pharmacology at the University of California Medical School, is chairman of the Advisory Committee on Medicine for the Hall of Science. Dr. Nina Simmonds, nutrition expert of the University of California, is one of several authorities in the different fields who will serve with Dr. Leake.

Canadian Dietetic Association. It has been announced that the fourth annual convention will be held at Bigwin Inn, Lake of Bays, Muskoka, June 16–17, 1939. An interesting program and the prospect of a visit to the north country, it is hoped, will appeal to a great number of dietitians.

Maryland Dietetic Association. The December 12 meeting was held at the Johns Hopkins Hospital. The business meeting was followed by a program arranged by the Administration Section, Kathleen Lewis acting as chairman. Miss Lewis discussed the projects outlined by the national Administration Section for the coming year. Mr. Ferdinand A. Korff, director of the Bureau of Food Control of the Baltimore Department of Health, spoke on "Food Poisoning and the Value of Adequate Examination for Food Handlers." He detailed his experiences with various outbreaks of food poisoning, discussing the different causes and means of prevention. Following the discussion, Miss Lewis and her staff entertained the group.

All new members of the association were guests at a welcoming tea arranged by the Hospitality Committee, Marguerite Betts, chairman, on Sunday, December 4, at the Goucher College Alumni Lodge. Refreshments were furnished by the Betsy Patterson Specialty Shop and arrangements for the tea were made by Emma Childs of Goucher College.

Two meetings have been sponsored by the Diet Therapy Section, Betty Olsen, chairman, for all those interested in modern trends of diet therapy. Round table discussions covered the following subjects: dietary management in diabetes; the extent to which protamine insulin is used; the use of liver versus liver extracts for anemia patients; the need for iron medications for patients on limited protein and fat diets; the low-fat meal in gall-bladder series; the extent of the usage of vitamin tablets or vitamin-

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reinforced foods in the hospital dietary; and salt and protein restricted diets. The Diet Therapy Committee also conducted the January meeting of the association which was held at the Franklin Square Hospital.

Ernestine Becker of the Johns Hopkins School of Hygiene and Public Health, will begin her series of lectures on nutrition on March 2, at 8.00 p.m. All interested in a "refresher" course in nutrition are urged to attend.

Massachusetts Dietetic Association. The November program of the association centered about reports of the Milwaukee meeting. In December, Professor C. E. Turner, professor of biology and public health, Massachusetts Institute of Technology, and chairman of the Health Section, World Federation of Education Association, discussed "The Growing Importance of Health Education in the Field of Dietetics in Schools of the World." Moving pictures taken by Professor Turner during his recent world trip in the interests of health education contributed greatly to the success of the meeting.

Beula Marble, president-elect of the American Dietetic Association, visited New York in December to consider possible hotel accommodations for the 1940 meeting. In November, Mrs. Marble attended the Iowa Dietetic Association meeting in Ames and the Nebraska Dietetic Association meeting in Omaha. While in Iowa City, she visited the University Hospital which she left ten years ago.

Quindara Oliver Dodge and Mary Spalding attended the Conference of Food Service Directors in Rochester, New York, in November. Miss Spalding presented the report of a survey of a food study in school lunchrooms.

Margaret Elder, formerly an assistant dietitian at the Peter Bent Brigham Hospital, was married in December to Dr. Nathan Milliken who is located in Hanover, N. H.

Marjorie French, formerly at the Union Hospital, Lynn, was recently married to Mr. Eric Wetterlow, Jr., of Manchester, Mass.

The Health Department of the City of Newton has just opened a Pre-School Conference. A survey and preschool conference demonstration made last year by the Division of Child Hygiene, Massachusetts Department of Public Health, proved conclusively the need for and the value of this work. Charlotte Raymond, community nutritionist of Newton, will be a regular member of the staff of these conferences which are held twice a week in a specially equipped room at the Newton City Hall.

Ruth L. White of the Forsyth Dental Infirmary recently conducted a field trip at the Infirmary for student dietitians in the Boston training courses.

Helene Henley, formerly assistant dietitian at Phillips House, Massachusetts General Hospital, has accepted a position at Columbia Hospital, Milwaukee, Wisconsin. Her successor is Dorothy Palmer, formerly of the University of Michigan Hospital, Ann Arbor, Michigan.

Mary Hannaher, a graduate of the 1937–38 training course at the Massachusetts General Hospital, is now assistant dietitian at Cincinnati General Hospital, Cincinnati, Ohio.

The following have recently been appointed as community nutritionists: Alice Wagonfeld, Wellesley; Miriam Black, Lexington; Helen Perry, Quincy; and Grace Bixby, Norwood.

A recent issue of the teachers' magazine *Understanding the Child*, which is published by the National Committee for Mental Hygiene, was devoted to a school project in Norwood, Massachusetts. Gertrude Spitz is the nutritionist in this program which aims to integrate the physical and mental health of the first grade child.

Marjorie Foster of Boston Dispensary Food Clinic is teaching a Massachusetts university extension course in dietetics for business women and homemakers.

Several association members attended the December meeting of the Social Welfare and Public Health Section, New England Home Economics Association. Marie Donohoe, mental hygiene supervisor of the Community Health Association, spoke on the subject "The Psychiatric Approach in Family Health Teaching."

Greater New York Dietetic Association met on January 9 at Teachers College, Columbia University, New York City, with Dr. Grace McLeod, professor of nutrition, Teachers College, speaking on "Recent Findings in Nutrition."

Oklahoma Dietetic Association. The December number of *The Dietitian*, newsletter of the association, carried an attractive cover typical of the season, a complete report of the House

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Food experts look to National Biscuit Shredded Wheat-and-milk as the dish to delight the appetite and provide *balanced nourishment.*

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5. PHOSPHORUS helps build teeth and bones.
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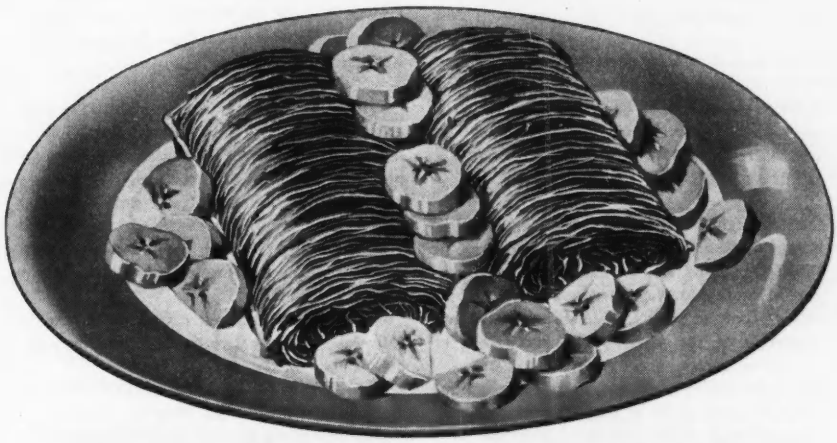


NATIONAL BISCUIT SHREDDED WHEAT

THE *ORIGINAL* NIAGARA FALLS PRODUCT

THE SEAL OF PERFECT BAKING NATIONAL BISCUIT COMPANY

of Delegates' meeting held at Milwaukee, details concerning requirements for active membership in the national association, and a delightful report of the social functions at the Milwaukee meeting. Other papers concern the food units in the Oklahoma and Agricultural Mechanical College, interesting details regarding recipes and favors for the holiday season, and condensed summaries of papers presented at Milwaukee.

The annual state meeting will be held in Tulsa, April 21–22. Mrs. Beula Becker Marble, president-elect of the American Dietetic Association, will be guest speaker and official representative of the national association at the meeting.

Philadelphia Dietetic Association. On January 10, Dr. Georgian Adams, associate specialist in foods and nutrition, Bureau of Home Economics, United States Department of Agriculture, presented "Recent Studies in Food Composition" which was of special interest and helpful in keeping up with the times. Members of the Philadelphia Metabolic Association were guests.

The annual welfare party was held on January 24 at Mount Sinai Hospital with the Hospitality Committee as hostesses. Bridge, deck sports and games provided entertainment as well as remuneration for organized charitable agencies.

Pittsburgh Dietetic Association members were guests of Charlotte Addison and her staff at West Penn Hospital for their November meeting. Dorothy McNaughton gave a very interesting report of the A. D. A. annual meeting. A feature of the evening was the serving of attractive refreshments.

The December meeting was held in the form of a Christmas party at the Allegheny General Hospital with Edith Langille, Catherine Fry, Ruth Sylvester and Marian Davy as hostesses. A "covered dish" dinner was served in the nurses' cafeteria. The tables were attractively arranged with a red candle as the centerpiece. Individual cakes, with a lighted red candle in the center of each, comprised the dessert course. After dinner the guests went to the nurses' home where everyone received a present from a grab-bag. The entertainment was provided by a fortune-teller who revealed the future for Pittsburgh's dietitians.

Texas Dietetic Association. The Dallas Dietetic Association held its regular monthly meeting in December at Stoneleigh Court. Various members of the group discussed the methods of accounting and purchasing used by their respective organizations. Each person was asked to bring forms or blanks which might be helpful to others. Dr. Grace M. Augustine and Nell Morris of the Texas State College for Women, Denton, brought over one of their institutional classes to visit the Dallas Public School Lunchrooms. All remained to attend the December meeting.

New members of the Dallas association are Dr. Grace M. Augustine, and Dr. Florence Scoular and Sadie Kate Bass of North Texas State Teachers College, Denton.

Lou Elva Eller, director of Public School Lunchrooms, Houston, was recently accepted for active membership in the A. D. A.

The November meeting of the South Texas Dietetic Association was held at Jefferson Davis Hospital, Houston, with Gladys Lyons and Louise Altman as hostesses. Blake Bryson Patrick led the discussion on "Review of New Reference Material."

Wisconsin Dietetic Association. The association has returned to its normal routine following the sessions of the A. D. A. in October. A post-convention meeting was held at the home of Breta Luther Griem and a résumé of convention reports given by the various members.

Colette Gingrass is on leave of absence from Milwaukee County Hospital and Janet Wing is relieving during her absence.

Mrs. Esther Shellman, formerly dietitian at Milwaukee County Dispensary, announces the birth of a son.

Agnes Walish has accepted a position as dietitian at Misericordia Hospital, Milwaukee.

Marcella Stoyk has left St. Mary's Hospital, Milwaukee, and Marie Ryan is taking her place.

Elsie Stewart, formerly dietitian at Statesan, Wisconsin, was recently married to Mr. Eugene Spengler. Doris Johnson of Madison has accepted the position vacated by Miss Stewart at Statesan, Wisconsin.

Toine Gildersleeve has resigned her position at Columbia Hospital. Her position will be filled by Helene Henley, who received her dietetic training at Massachusetts General Hospital.

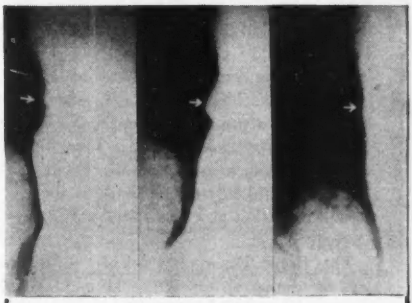
PEPTIC ULCER PAIN RELIEF from U. S. P. GELATINE (KNOX) ... according to Recent Clinical Study

Frequent "concentrated" feedings of pure U.S.P. Gelatine have, in the experience of Windwer and Matzner,* given prompt symptomatic relief in 90% of a series of cases of peptic ulcer without the use of drugs or chemicals.

The advantages of this clinically tested peptic ulcer regime are, quick relief from pain, no untoward effects from cumulative, irritating drugs, freedom from alkalosis, and no undue interference with digestive functions.

Knox Gelatine is 100% pure U.S.P. Gelatine—85% protein in an easily digestible form—contains no sugar and should not be confused with factory-flavored, sugar-laden dessert powders. "Concentrated" feedings of Knox Gelatine are easily prepared in appetizing form and are well tolerated. Send for recipes.

A simple formula for the preparation of concentrated Knox Gelatine feedings, useful in peptic ulcer is, stir quickly one envelope (approximately 8 grams) of Knox Gelatine in ¾ of a glassful of drinking water and have patient drink quickly before it "sets" or gets lumpy.



CASE I—FEMALE, 74
Uncomplicated gastric ulcer first demonstrated by Roentgen rays in 1934. Diet and alkalies afforded little relief. Accompanied by loss of weight. Repeated X-ray studies in 1936 and 1937 showed no improvement. She was placed on a diet-gelatin regime in November, 1937. Relief immediate. Gained weight. Roentgen studies in April, 1938 showed no demonstrable ulcer.

*Windwer and Matzner, *Am. Jl. Dig. Dis.*

WRITE DEPT. 466

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Sister Jovita, who has been in Denver for the last few years, is returning to assume her duties again as director of the Dietary Department of St. Joseph's Hospital, Milwaukee.

Lillian Otto Fried of Ann Emery Hall, Madison, spent the Christmas holidays in Bermuda.

Grace Lamm has accepted a position as dietitian at Municipal Hospital, Waukesha, Wisconsin.

The Milwaukee Dietetic Association met in November at the Y. W. C. A. with Rachel Ruffner as hostess. Following the dinner, Pearl Metzelthin spoke on "Chinese Food Habits."

Helen DuChene and her assistants at St. Joseph's Hospital entertained the Milwaukee Dietetic Association at a Christmas party early in December.

The Home Economics Women in Business met for dinner at the White Manor Inn, Milwaukee. Following the dinner, Ella Liner Lambert and her assistants of the Home Service Department of the Milwaukee Gas Light Company gave a demonstration on Christmas breads and cookies.

News from Advertisers and Exhibitors. The *Irradiated Evaporated Milk Institute*, Chicago, announces that its Home Economics Department has prepared a new Quantity Recipe Service. Recipes will be printed on 4 x 6 cards which are practical to use and convenient to file. Each recipe is stated in quantity and family style. Readers of the JOURNAL may have this service free of charge. The Institute has just published a booklet entitled "The Story of Irradiated Evaporated Milk." The text covers the value of milk in the diet, the significance of vitamin D and irradiation, the major steps in processing irradiated evaporated milk, and its nutritive value and uses in the diet.

Gerber Products Company, Fremont, Michigan. Dr. Lillian B. Storms, nutritionist, has just completed a revised edition of her booklet, "Recipes for Special Diets." Many helpful suggestions are included for variations in the bland and low-fiber diet. Complimentary copies are available on application to this company.

National Dairy Council, Chicago, has available for distribution a helpful booklet entitled "Health Education Materials" which describes booklets and posters of great assistance in teaching.

The 'Junket' Folks, Little Falls, New York, through Mary Mason, director of the Home Economics Department, announce that their diet lists available for the use of professional people such as physicians, dietitians and nurses, are now available. These sheets cover the ulcer, bland, low calorie and high vitamin diets and those suitable for children of varying ages. In connection with the feeding of children, Dr. Grace Langdon has just prepared for the same firm a helpful little booklet entitled "How to Get Children to Eat."

The *California Dried Fruit Research Institute*, San Francisco, have a particularly interesting booklet covering the story of figs, their nutritive value, and use in a number of recipes. They announce that Raisin Week will be observed May 8–14, terminating with Raisin Day which will be featured by the internationally known West Coast Relays. This institute also has a collection of recipes arranged in card form for filing.

Kraft Phoenix Cheese Corporation, Chicago, through Mary Dahnke, director of the Home Economics Department, have an excellent collection of recipes on cards and suggestions for luncheon and dinner plates, particularly helpful to the lunchroom manager as well as the hospital dietitian.

Pet Milk Company, St. Louis, in addition to sheets of quantity recipes and suggestions for time and money-saving meals as planned by their experimental kitchens, have available for distribution an attractive booklet "Food for a Family of 2, or 4, or 6," by Mary Lee Taylor. Their answer to the problem, how to eat the needed quart of milk a day, is covered in another booklet entitled "Recipes Rich in Milk".

Among the many excellent booklets and literature distributed by the *General Foods Corporation* is an attractive booklet on "Jello" entitled "Jack and Mary's Recipe Book". Another named "Easy Triumphs with the New Minute Tapioca", gives an almost endless number of delicious ways to use this food. A sugar-free gelatin dessert is made in the same six flavors as "Jello." Among the helpful features offered by this firm is a sheet listing the products which are wheat-free, egg-free, and so on, for

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ABSOLUTELY! AS YOU KNOW, CHILDREN REQUIRE 6000–8000 UNITS A DAY. AND SINCE EVERY POUND OF NUCOA CARRIES AT LEAST 7500 U.S.P. UNITS OF VITAMIN A, 2 OZ. OF NUCOA SUPPLY ABOUT 1000 UNITS—OR ABOUT 15% OF DAILY VITAMIN A REQUIREMENTS[1]
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IT HAS! NUCOA IS A VERY NUTRITIOUS FOOD AND IN MY OPINION IT'S EXCELLENT FOR ACTIVE CHILDREN. I NEVER HESITATE TO RECOMMEND NUCOA TO MY STUDENTS
FREE! NEW "MENU PLANNER"!!
1. Booher, Jrl. Amer. Med. Assoc., Volume 110, P. 1920, 1938.
2. Holmes and Deuel: Am. Jrl. Physiol., Volume 34, Page 479. (Recently confirmed in experiments with New Nucoa by university workers.)
THESE FACTS ABOUT NUCOA ARE VERY INTERESTING. I'M GOING TO GET A POUND AND TRY IT IN MY OWN KITCHEN!
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use in allergy diets. On the reverse of this sheet the ingredients in the various General Foods products are listed. Especially noteworthy is this firm's system of arranging recipes on cards; the reverse of each permits a record of the cost of table d'hôte and à la carte portion of these dishes at a given date.

Among the excellent educational material distributed by the *American Can Company*, New York, through its research department and nutrition laboratory, is a collection of cards covering references to the literature and brief abstracts on the vitamin values of canned foods and related subjects.

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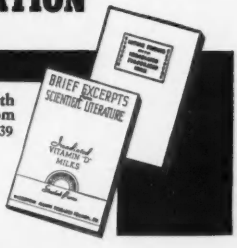

WHO'S WHO IN THIS ISSUE

Mary S. Rose, Ph.D., professor of nutrition, Teachers College, and a frequent contributor to this JOURNAL, was noted under this section in the October 1938 issue. Mrs. Rose has long been a leader in promoting the better health of the child. A recent contribution of hers, *Our Cereals*, concerning the means of encouraging the school child's use of whole grain cereal products, was reviewed in this JOURNAL for January.

Edwin J. Kepler, M.D., is an associate of Drs. Haines and Rynearson in the clinical section of The Mayo Clinic, Rochester, Minnesota. Dr. Kepler's interests have centered around the treatment of diabetes mellitus. Among the recent publications of which Dr. Kepler was co-author are "Intake of Potassium, an Important Consideration in Addison's Disease", appearing in the *Archives of Internal Medicine*, and "Protamine Insulin as an Adjunct to the Treatment of Diabetic Acidosis and Coma", which was included in the *Proceedings of the Staff Meetings of the Mayo Clinic* for 1937.

Waldo E. Nelson, M.D., is a fellow of the Children's Hospital Research Foundation, Cincinnati, and assistant professor of pediatrics in the College of Medicine and Graduate School of the University of Cincinnati; attending pediatrician to the General Hospital and the Hamilton County Tuberculosis Sanitorium; and medical director of the Children's Convalescent Home, Cincinnati.

Estelle E. Hawley, Ph.D., was a contributor to the August–September 1938 JOURNAL and was noted under this section for that issue. Dr. Hawley has done notable work in the field of vitamin research, particularly on vitamin C. A short report of hers on "Vitamin C Content of Fruit Juices" appeared in this JOURNAL for September 1937, and "Vitamin C Content of Milks: Raw, Pasteurized, and Baby Formulae" in April 1938. In October 1938, Dr. Hawley was appointed a member of the Journal Board for the American Dietetic Association.

Florence Quast is a member of the American Dietetic Association, the American Home Economics Association and the National Restaurant Association. As an associate professor in the College of Home Economics and head of the Department of Institution Management at Syracuse University, her work includes both instruction and management. The food services of the college cafeteria, the student club room and the faculty club are under her supervision. Miss Quast received the B.S. and M.S. degrees from the University of Washington. She was formerly a member of the faculty at San José State Teachers College, California.